

AMERICAN VETERINARY REVIEW,

AUGUST, 1894.

NOTICE.—Please address all communications regarding matter for publication, books for Review, Exchanges, etc., to the Editor, 139 and 141 W. 54th St., New York.

EDITORIALS.

ANOTHER IN THE RANKS.—In several numbers of the REVIEW we have urged the necessity of the various steps which, in our opinion, were the most important to raise the standard of the veterinary profession. We have often and again said how, by the organization of a board similar to that which exists in Great Britain—a Board of Examiners, in other words—the education would have to be improved, the requirements and the curriculum of schools increased, and, as a consequence, a degree of superiority among veterinarians which would prove a great benefit to all who may be in need of their services.

It is true, we asked that this Board of Examiners be national; but we were too anxious. Above national interests there are State Rights, and these, it seems, cannot at present permit of a national organization having for its duty the qualifying of persons who shall be guardians of our national animal wealth.

But our advice was not altogether erroneous, and a State Board of Examiners will, for the present, do very well. They will open the ground for the creation of a higher board, and if, for the present, they will only tell who shall or who shall not practice veterinary medicine, a day will also certainly come when they will take direct part in the examination for graduation at the veterinary colleges, and a day will certainly come when they will unite to decide as to a uniform title or degree for one and all of American veterinarians.

In the REVIEW of last month we published the act which in Virginia created the State Veterinary Medical Board. In this issue we give the bill passed in Ohio establishing the State

Board of Veterinary Examiners, which was sent to us by Dr. H. M. Ball, of Columbus, and among the various sections which the bill presents, we will call the attention of our readers to Section 4, which regulates the organization of the Board, and Section 9, which puts a pretty strong check on the future growth of some of our two-year diploma mills.

NORMAN BOVINE RACE.—Our remarks in the June REVIEW upon the superior quality of this French breed, which has been suggested to us to take the place of the fashionable and excellent cows which, after having been such a favorite among our people, is unjustly losing its reputation because of the extensive presence of tuberculosis among them, have brought us a large number of inquiries upon the Cotentine cow—her milking qualities, her endurance, size, etc., and to answer these letters in a rather concise manner we reprint a short article from the pen of a gentleman who has owned, for his pleasure, Norman cows for some time, and who merely writes because of his thorough belief in the qualities which he considers will soon be the favorite milking cow of our wealthy owners of cattle in their large and fancy dairies.

THE EXTERNAL CONFORMATION OF THE HORSE.

BY PROF. E. A. A. GRANGE, V.S., Michigan.*

Some time ago the veterinary department issued an advance bulletin having reference to the external conformation of the horse, in which some scales of points were presented, and those interested were asked to make such changes as to them seemed proper and best. The hearty response which met the request has been most encouraging; while the replies furnish much valuable information, of which advantage will be taken when we come to that feature of this issue that bears upon the scales of points.

Numerous communications have also been received commending the work of research upon the different styles of

*A Reprint from Bulletin 110—Experiment Station, State Agricultural College.

conformation met with in commercial horses of the present day, and many correspondents express a keen desire to be informed on all points in connection with the subject of this bulletin.

Before describing the points of the animal it may be well, first of all, to define the expression we so often hear, "*a good horse!*" and will do so by saying that associations have led us to regard *a good horse* as one which excels in many ways, fails in few, and is not remarkably deficient in any point. Of course that is treating the question somewhat broadly, for some horses are able to trot at a very high rate of speed, and are regarded as good horses by those who look upon speed as the chief feature in their ideal animal; yet these same animals may be affected with forms of unsoundness that would cause them to be rejected in any show ring, and the same may be said of horses used for the performance of any special duty.

I do not think it makes any particular difference where we begin with the description of a horse, for if we do the work thoroughly we eventually cover the whole animal; but as it has always been our custom, in work of this kind, to start with the head we will continue in that line here; indeed, in some respects the head may be regarded as the frontispiece of the animal, it being the feature above all others which imparts the physiognomy or expression to the creature.

The head may be divided for the convenience of description into the following regions, *vis.*: The ear, poll, forehead, face, nostrils, muzzle, mouth, cheek, eye, lower jaw and jowl, intermaxillary space.

The ears (Plate II. Fig. 1-1) are situated towards the sides of the top of the head, and, like many other parts of the horse, are subject to differences of opinion in the minds of individual horsemen as to their proper size and shape, as well as to their position upon the head. Some like what they call good large ears set well apart, while others prefer much smaller ones and made up in a more delicate manner throughout. As far as our own observation has gone, the ear which has most admirers is

the one which is composed of a mere shell, or grisle, enveloped in a layer of thin skin, which should be clothed in a coat of fine hair, that may, however, be somewhat meagre on the inner surface, especially in the summer season.

In shape the ear should taper from the base to a rather sharp point at the tip; its movements should be energetic, but not of the quick, jerky order; they should not be slow or sluggish, because that would indicate a defect in hearing, or the animal is quite likely to be a dull, stupid brute, while those with quick jerky ears are liable to be vicious or ultra-nervous creatures.

Experience in selecting horses has led us to observe the movements of the ear with much care, and regard them to some extent as the index to the animal's character, for they not only indicate a well-balanced disposition, a vicious or sluggish horse, as the case may be, but they point to defective eyesight, or even total blindness, in which case the ever restless ear will be thrown first in one direction and then in another.

The position of the ears upon the head plays an important part in the artistic appearance of it; if they are too near the center they cause a disagreeable, puny expression, while if they are too close to the lateral borders they give the head a somewhat coarse expression. When erect the ears should stand boldly up, inclining in an oblique direction from below upwards and forwards; when they project in an outward direction, approaching the horizontal, they are called lop-ears, a style of conformation that is not admired.

The poll (Plate I, 3) is situated at the top of the head (being covered in part by the arch formed by the headstall of the bridle or halter), its shape is not often criticised, though we occasionally meet with saddle horses that are injured from the artistic standpoint owing to the poll being flat and expanded, giving the upper superficies of the neck and back of the head a plain, coarse look, and as this feature is practically always under the eye of the equestrian, it is very liable to diminish the value of the animal in the high-class saddle horse market.

The forehead (Plate II, Fig. 1-2) is that part of the head between the eyes, extending as high as the top of the cranium, the superior border affording a point of attachment for the forelock; the upper portion forms a large part of the wall of that cavity which contains the brain, while the lower portion forms the forehead proper, a space that is most admired when it is broad and flat.

Connoisseurs in horse-flesh prefer plenty of space between the eyes, and some even go so far as to say that a broad forehead is indicative of intelligence, but as this part of the bone does not cover the brain (the seat of intelligence) it is hard to conceive how its shape can control such an important feature in an animal. When the space between the eyes is well developed that portion of the interior of the head to which the nerve of special sense of smell is distributed would naturally be larger in proportion, on that account the smelling power of the animal with the broad forehead may be increased, and if it be true that the horse is capable of judging of the quality of things by their odor, we can then explain why the horse with the broad forehead and well developed organs of special sense of smell may appear more intelligent than his less fortunate neighbor with the narrow one.

In some instances the forehead is convex in outline, a style of conformation which is not regarded with favor from an artistic point of view, though it is not likely to interfere with the animal from the practical standpoint.

The face (Plate II, Fig. 1, 3-3) is the region situated below the forehead, the bones of the nose forming the principal part of it. The outline of the anterior aspect of the face should be straight or nearly so, causing the nose to be rather of the Grecian order; the sides of the face may be very slightly dished. The bones of the nose are often arched, a style of conformation that is not only unpopular, but in the extreme it may interfere with respiration during severe exertion, owing to the peculiar attitude the soft tissues, which form the nostrils, assume when hanging loosely from such bones, and their position makes it

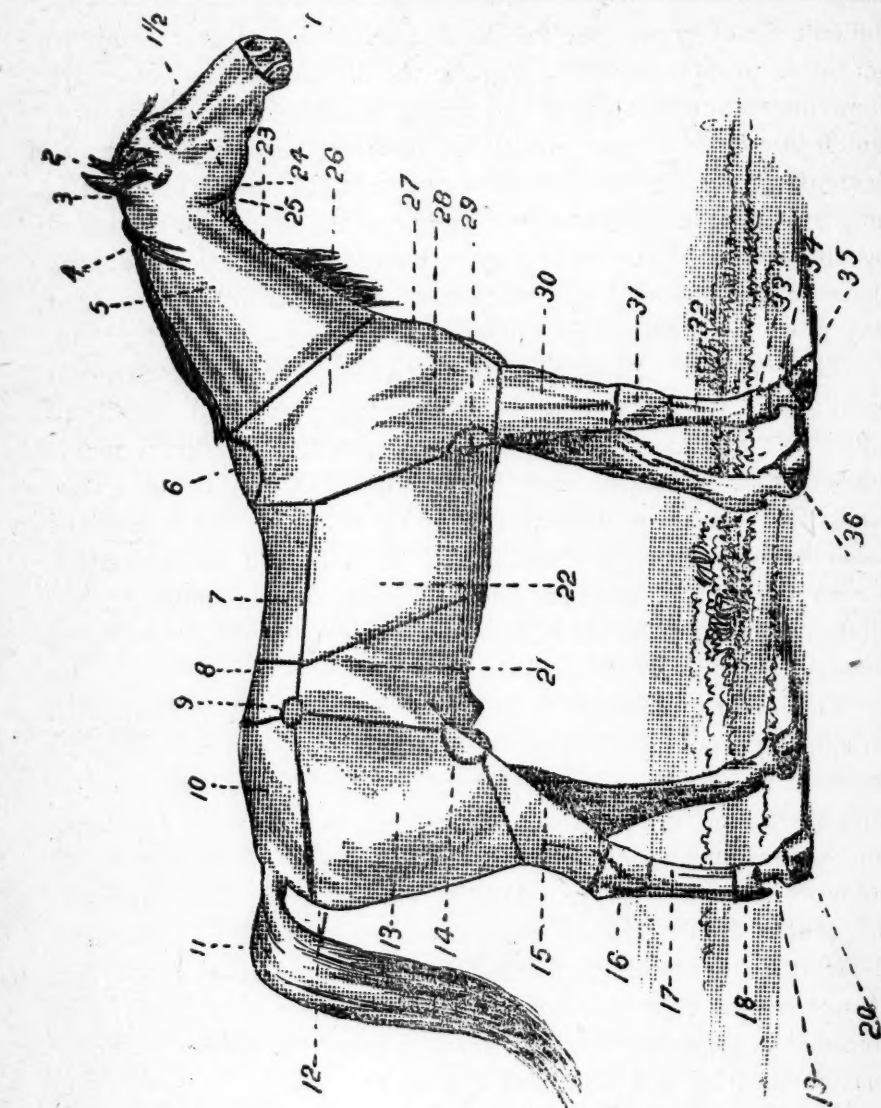


PLATE NO. 1.—REGIONS OF THE HORSE.

- | | | |
|----------------------|---------------------------|---|
| 1 Muzzle. | 13 Haunch or upper thigh. | 25 Throat. |
| 1 1/2 Cheek. | 14 Stifle. | 26 Shoulder. |
| 2 Crest of occiput. | 15 Gaskin or lower thigh. | 27 Point of shoulder. |
| 3 Poll. | 16 Hock. | 28 Arm (from point of shoulder to elbow). |
| 4 Crest of the neck. | 17 Shank. | 29 Elbow. |
| 5 Neck. | 18 Fetlock joint. | 30 Forearm. |
| 6 Withers. | 19 Hind pastern. | 31 Knee. |
| 7 Back. | 20 Hind foot. | 32 Front canon. |
| 8 Loins. | 21 Abdomen and flank. | 33 " fetlock. |
| 9 Point of hip. | 22 Chest. | 34 " pastern. |
| 10 Croup. | 23 Jugular gutter. | 35 " foot. |
| 11 Dock and tail. | 24 Jowl. | 36 " coronet. |

difficult if not impossible for the muscles which control them to act in a proper manner. Again the bones of the nose are sometimes concave, giving the animal a dish-faced appearance, which in extreme cases may also interfere with respiration, by decreasing certain diameters of the nasal chambers, but it is only in very rare cases that the merits of the animal are affected by the shape of the nose; notwithstanding this, however, the shape of the nose is a very important point, for it goes a long way in giving a pleasing or disagreeable expression to the head.

The nostrils (Plate II, Fig. 1, $4\frac{1}{2}$ - $4\frac{1}{2}$) are the external openings of the nasal chambers; they are composed largely of a fine skin and cartilage or gristle, and lined by a delicate membrane which in health and during repose should be of a rose pink color; exercise or disease alter the color of this membrane considerably. The openings should be large and easily dilated; if they are small and composed of thick tissues which do not dilate readily, the horse will most likely prove defective when it comes to severe exertion.

The muzzle (Plate I, 1) of the horse is a region somewhat indefinitely spoken of as the end of the nose, but to define its limits I regard it as that part of the head extending from an imaginary line drawn around the lower portion of it and in its course passing over the angle of commissures of the mouth, all below this line to be included in the muzzle. The outline of this region does not seem to make any difference to the animal as far as its merits are concerned, but from the artistic standpoint it must not be coarse and expanded, but fine and inclined to be pointed; to express this some horsemen say the animal "should be able to drink out of a wine glass."

The mouth splits the last region into two parts. It should be of moderate size, not deep enough to remind one of the mouth of an alligator, nor so shallow that it resembles the mouth of a sheep; it should be bounded, as it were, by moderately firm lips. We do not think that its size or shape has anything to do with the general utility of the animal.

The cheek forms a large portion of the lateral aspect of the

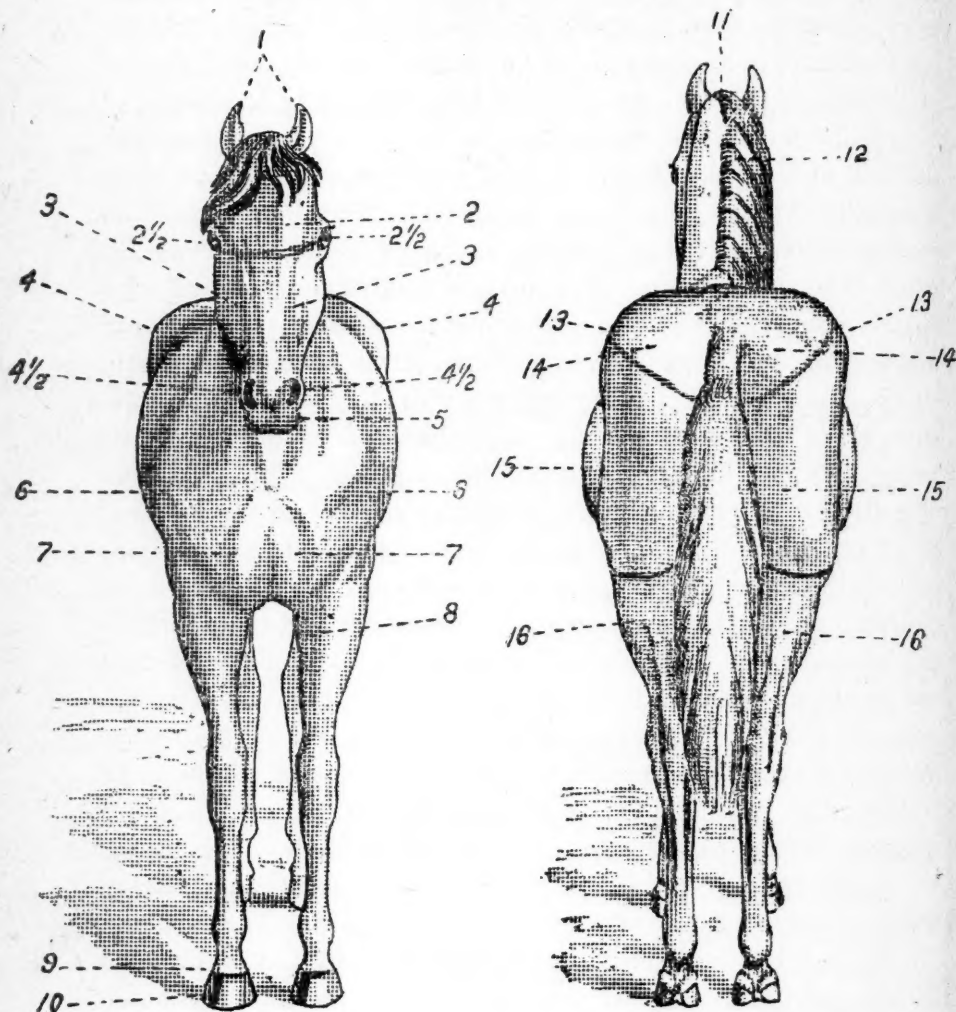


PLATE NO. 2.—REGIONS OF THE HORSE.

- 1 Ears.
- 2 Forehead.
- 2½-2½ Outside points of the forehead.
- 3-3 Face.
- 4-4 Points of hips from the front.
- 4½-4½ Nostrils.
- 5 Muzzle.
- 6-6 Points of shoulders.
- 7-7 Muscles forming breast of bosom.

- 8 Forearm.
- 9 Coronet.
- 10 Wall of the foot.
- 11 Crest of the occiput.
- 12 Crest of the neck.
- 13 Points of the hips from behind.
- 14-14 Croup from behind.
- 15-15 Haunch or upper thigh.
- 16-16 Gaskin or lower thigh.

head. As we believe that this region of the head deserves more attention than it usually receives, a word or two concerning its anatomy may not be out of place here. It is composed of an outside covering of skin and hair, and an inside layer of a skin-like mucous substance called *buccal membrane*; between the skin and the membrane we will find two muscles which are especially worthy of our attention. The first one, called the *buccinator*, occupies that portion of cheek nearest the mouth, which is loose or flabby. This muscle is of interest because it is largely concerned in keeping the food in its proper place during mastication, by pressing it, as it were, between the molar teeth, which, figuratively speaking, are the mill stones that grind the corn, etc. The next muscle may almost be looked upon as being of more importance than the first, for again, speaking figuratively, it supplies the *power* which drives the mill stone; this muscle is called the *masseter* (one on each side of the head) and is situated upon the upper or posterior half of the cheek. It is firmly attached to the upper and lower jaw and is the principal muscle of mastication, and as this is one of the important processes of digestion it must be thoroughly performed, or the animal will not remain vigorous or in a state of perfect health. We believe that imperfect mastication, or grinding of the food, is often the starting-point of indigestion and all its evil consequences, hence, that this act be properly performed, the *masseter* should be well developed, and we like to see them standing boldly out upon the cheek.

The eye is a most important part of the head. It is regarded as being defective from an artistic point of view when it is small and concealed, reminding one of the eye of a pig, or when it is too large, round and prominent, like the eye of an ox. It should be well developed, round, and preferably of a brown color.

When there is an absence of the coloring matter of the eye, it will be very light colored, in appearance which usually goes under the name of (watch) *wall eye*.

The eye is frequently regarded as the index of the animal's

character, but I have been deceived so often by both kinds, the mild as well as the sulky looking, that I am now disposed to think that it is often over-estimated as a guide for future performances.

The acuteness of vision may be determined by making passes with the hand in front of the animal, in proximity to the organ, examining one eye than the other, taking care that too much force is not exerted, as currents of air may be produced which will cause the animal to blink, and this blinking mistaken for actual vision.

The lower jaw is composed principally of a large bone, the front part of which forms a solid foundation for the implantation of the lower incisor teeth. This part is called the body, and springing from it are two large rami or branches; the branches turn suddenly upward toward the base of the ear, near which they form the joint of the lower jaw.

The angle of inflection is often designated the jowl (Plate I, 24). This point if coarsely constructed, through the bone being too broad, is sometimes taken exception to, and the animal criticised for being too thick in the jowl, or is occasionally called heavy-jawed.

The inter-maxillary space is the V shaped channel formed by the spread of the branches of the lower jaw. The channel should be deep enough to make its presence quite perceptible. When the groove forming the channel does not exist, owing to the space being filled with thick skin or other soft tissue, the head has a beefy look, as it is called, a style of conformation that is disagreeable.

The inter-maxillary should be broad between the angles of the jaw in order that the top of windpipe (*the larynx*) may have plenty of room for its eccentricities in all attitudes of the head.

The head should be attached to the neck in a manner that a line drawn through the centre of it will form a right angle with a line drawn along the center of the neck, when the animal is standing in its natural position. When the angle is more obtuse than a right angle, causing the nose to protrude, the horse al-

ways appears as if suffering from a sore throat; or if the angle is still more obtuse, it will resemble the attitude assumed in chronic poll evil; on the other hand if the angle be considerably more acute than a right angle the act of respiration may be interfered with during extreme exertion. A head that is not nicely set upon the neck deteriorates the value of a high class horse considerably, although it may not interfere with the merits of the animal.

It is somewhat difficult to say, in a general way, how the head of one class of horses should differ from that of another; all for instance are entitled to the fine ears, the broad forehead, the straight nose, etc., etc.; at the same time a coarse ear, which might be tolerated in a draft horse, would more than likely be taken exception to in the thoroughbred; then heads are coarse or fine in all breeds without apparently affecting the merits of the animal, but the same cannot be said of the neck which is the region of the horse next to be described.

The neck (Plate I, 5) may be regarded as the part extending from the poll to the withers along its upper border, and from the throat to a point a little above the anterior extremity of the breast bone on the lower border. In all breeds of horses we meet with different kinds of necks that are named from their supposed resemblance to certain objects, but the kinds we oftenest meet with are the bull neck, the peacock neck, the ewe neck, the straight neck and the clean cut neck.

In selecting a horse the form of neck must be taken into consideration, and the kind of work the animal is to be engaged in, before we pronounce upon it as being good or bad in form.

The bull neck is the one which is strikingly short and thick; it is usually credited with being indicative of strength and consequently is best adapted for draft horses, but even in them it is doubtful if it is advisable to encourage the breeding of horses with short necks, for innumerable draft horses have been brought under our noses with moderately long necks and we have yet to learn that they were deficient in strength when it came to the starting of a load. The bull necked horse would certainly not

do for saddle purposes because he would not be graceful in his movements, and men who ride high class horses, like them with plenty of rein, in order that they may be handled in a more agreeable way; it is not a pleasant thing to have the horse's head too near you when in the saddle.

Those who drive generally prefer the rangy neck to the short variety for similar reasons.

The peacock neck is one which usually has many admirers; the name is given to it from the supposed resemblance to the neck of that bird. The style of conformation is occasioned by the upper border of the neck (*the crest*) becoming somewhat elevated or unusually prominent about six inches from the poll; they are found in all kinds of horses and, while they do not indicate anything of special value in the line of merit, they are coveted on account of their beauty.

The ewe neck is one in which the upper border is concave instead of being convex and the lower border bulges more or less, giving rise to the expression, "that neck is upside down." Many good horses are formed in this way, though it is a form that is often objected to, more from its appearance than anything else we are aware of.

The straight neck is one in which the upper and lower borders are practically straight, tapering gradually from the chest to the throat; we find this style both in good and bad horses.

The clean cut neck is the one our preference leans towards; in it the muscles and other parts stand boldly out, the crest is prominent and whipcordy or wiry, the sides are marked by hard muscles, the lower border including the windpipe, stands out perceptibly leaving a prominent groove, the jugular gutter, between it and the neck above, gracefully incurvated near the throat and attached to the head in a manner that leaves a line of demarcation between the leaving off of the head and the beginning of the neck, doing away with the appearance of a *plastered on* head. The posterior part usually terminates perceptibly just in front of the withers, so that one can tell where the neck leaves off and the withers begin, a point that is not always easy to determine.

Necks of this nature are usually accompanied with a constitution that can stand a good hard day's work either upon the road or at the plow.

The body is the next division of the horse to be considered, and in order that it may be discussed somewhat in detail it is conveniently divided into the withers, the back, the loins, the croup, the chest and breast, the abdomen; other parts which may be looked upon as parts of the body are left to be considered with the limbs.

(To be Continued.)

ORIGINAL ARTICLES.

A DISCUSSION OF THE REPORT ON VETERINARY EDUCATION

By PROF. OLOF SCHWARZKOPF, V.M.D., Chicago, Ill.

(Continued from page 280 and Concluded.)

Much may be said in regard to an advancement of our professional education, but in order to do real good we had better confine ourselves to a few principal points and leave side issues for the future. Inasmuch as the education of professions is not dependent in this country from fixed rules and regulations of the national government, we will have to battle with as many different opinions as there are colleges. At present each college, or at least its graduates, firmly believe that theirs is the only one and the best in the world. I have heard such utterances so often and always spoken with such conviction that I am sure it will take a long time before this absurd prejudice will have been overcome and before we can establish a feeling of mutual respect and friendship from which alone we can form a united profession.

The few points we will have to agree upon are a higher standard of preliminary education of students, a higher qualification of instructors, a uniformly graded course of instruction and a uniform degree. In endeavoring to do so we are compelled from the start to exclude the "two year" schools. Their course presents an anomaly which cannot be assimilated. This proceed-

THE KANSAS CITY
VETERINARY COLLEGE
Incorporated July 29th 1884

ing will simplify the negotiations between the remaining colleges and makes a result tangible, and may lead to an association of three-year colleges.

It is now conceded by everybody that for the study of veterinary medicine in its present state of rapid advancement, the common education demanded by our colleges is ridiculously low. In fact it can hardly be conceived how a young man with such limited training can adapt his crude intellect for the study of any science at all. The trouble is that older and more developed professions than ours, for instance the medical profession, do not as a rule demand a higher school education from their students. Whatever advancement we wish to make will, therefore, have to be made gradually. A good english education is, of course, essential, but I believe the time has come when we should announce in the catalogues of our veterinary colleges that a limited knowledge of Latin (Grammar and Cæsar's *Bellum Gallicum*) is desirable, and that we should also encourage the knowledge of a little Greek (Reading of Xenophon's *Anabasis*). While we may not be able to make such knowledge obligatory from the start, it will tend to introduce its value to intending students. And if it is thus announced by all three-year schools it will harm no individual college. The study of German and French is also a great help to students, although in my opinion it will never equal the benefit derived from the mental training of these classic languages from which, besides we derive our whole medical terminology. For any further or sharply defined demand neither the profession nor the country is ripe; but that it is too much to-day is a mistake when we consider that France and Germany ask from their students a pre-education equal if not superior to the degree of M. S. or M. A. of our American Universities. Thus we can see how far back we are and will be for generations to come.

Prof. Liautard is right in severely criticising the mode of recruiting the faculties of our veterinary schools. But not only should the professor be a specialist in his particular branch, he ought to be also a model man as regards character and habits,

in short a professional gentleman. While this may be a delicate point for discussion it is one of great importance; for the appreciation and respectability of the profession does not merely rest upon the scientific attainments of a man, but perhaps more so upon his indisputable habits and tact. This phase of the question has been sadly neglected in forming veterinary faculties, as I have often heard disrespectful remarks by graduates about the habits of their teachers, a matter which is highly to be regretted as being possible at all.

Another point which needs criticizing is the more and more apparent policy of our American Schools to prefer their own graduates as teachers and professors. The cause of this policy is easily understood from the fact that the good qualities and talents of a man are easily recognized while he is a student at college. To a certain extent, therefore, this custom is natural and excusable, but if carried as far as it has been of late it creates "cliques" and "professional rings," which are liable to overestimate their ability and influence, and which must in time become a menace to the college.

If all the young and inexperienced V. M. D's. and M. D. V's. and D. V. S's., whose names constitute for the most part the faculties of our colleges, would exchange their places between Boston, New York, Philadelphia, Montreal, etc., the faculties so diversified would certainly receive a new impulse and take a vigorous development.

The course of instruction in our colleges as regards subjects is not so much inefficient as it is unsystematical. It seems as if the needs of the students are not fully grasped. Subjects which justly belong to the third year are crowded into the second or even the first year's course. The attempt to teach clinical medicine together or even before the purely theoretical branches are thoroughly mastered, is folly. It confounds the student and makes teaching difficult. The subjects should be arranged in their natural order. The first year should be wholly devoted to the introductory branches, the second year should finish the theoretical branches, and the third year should teach the student

the clinical aspect of medicine. Not before such a system is adopted can we look for a uniform standard of education.

Now a word about our American degrees. I suppose that we all feel that this matter has assumed a ridiculous shape. Think of a hack-driver that goes through a two-winter college course and then comes out a Doctor of Veterinary Science, a Doctor of Comparative Medicine, a Doctor of Veterinary Medicine or what else. Would it not be more humane toward such poor fellows to confer to them the degree of "H. D." Horse-Doctor? Their burden would certainly be easier. As things now stand we had better return to the V. S. which is good enough for any one, and leave all these preposterous degrees of Doctor to the disreputable colleges. I personally could never see the need nor the propriety of affixing the "Doctor" to our professional title. The intrinsic value of this degree is very low in this country. Learned Europe does not meddle with "Doctor" degrees and there is no M. D. or V. M. D. conferred upon students who pass the graduation examination. The simple title of "Medecin" and "Arzt," "Medecin Veterinaire" and "Thierarzt," is appreciated in France and Germany by all as designating men of higher education. If anybody there aspires to a Doctor degree he must go through special examinations, write dissertations, etc., etc., which is a costly undertaking and is sought for by few.

It is true that America is the home of the D. D., LL.D., and M. D., and a V. M. D. is a natural sequence. But from reasons mentioned above let us hope that a worthy degree may be found which could be adopted by our three-year schools. Let us hope this for the good of the profession at home and for its better appreciation abroad.

MY EXPERIENCE WITH TUBERCULIN IN A SMALL HERD OF CATTLE.

By C. E. CLAYTON, D.V.S.,

Late House Surgeon, American Veterinary College Hospital.

A local veterinarian was called to examine a horse on a farm in one of the adjacent towns, and while there was asked to look

at two cows that were not giving the amount of milk they should and were also coughing. Upon examination he suspected tuberculosis and called Dr. Liautard into consultation, who pronounced them both to be suffering with the disease. They were sent to the college to be destroyed but before doing so, it was decided to inject tuberculin that the students might watch the results as well as examine them, and also see the pathological changes occurring from this disease.

Cows No. 1 and 2 were admitted to the hospital January 3d, and the temperature taken three times the following day and on the 5th of January received an injection of $2\frac{1}{2}$ c.c. at 8 o'clock A. M.

COW No. 1.		COW No. 2.	
Before Injection.	After Injection.	Before Injection.	After Injection.
8 A. M. 101 4-5	101 2-5	102 4-5	100 3-5
10 "	101 2-5		100 4-5
12 M. 102	100 4-5	101 1-5	101
2 P. M.	101 2-5		101 2-5
4 "	101 1-5		101 2-5
6 "	101 1-5		101 2-5
8 " 101 4-5	104	101	103
10 "	105 1-5		105 4-5
1 A. M.	106 1-5		106 2-5
6 "	103 3-5		102 3-5
8 "	102 3-5		102 2-5
12 M.	102		102 2-5
6 P. M.	102 3-5		102 1-5

Post-mortem No. 1. Left lung with large tubercular deposits, tracheal glands very large and filled with calcareous deposits and also a few nodules on the liver.

Post-mortem No. 2. Thyroid gland very large and tubercular, small nodules on right lung and large lesions of mammary gland.

The owner saw these post mortems and wished to have the rest of the cows examined, so on the 8th of January I went to the farm, arriving at 6:45 P. M., took the temperature then and at 10 P. M., at which time they were injected, the same quantity being used as in the other two.

COW No. 3.		COW No. 4.	
January 8th, 7 P. M.	103 3-5	101	
10 "	103	101 1-5	Injected.
January 9th, 7 A. M.	102 1-5	101 1-5	
9 "	102 2-5	101 3-5	
11 "	102 4-5	102 3-5	
1 P. M.	102 3-5	105 2-5	
3 "	102 4-5	104 4-5	

Cow No. 3 giving no reaction, was not destroyed.

Post-mortem of cow No. 4 showed tubercular deposit on right lung about the size of a silver dollar and tracheal glands slightly affected.

COW No. 5, 1 year old.		COW No. 6.	
1 P. M.	101 2-5	101 4-5	
10 "	101	101 2-5	
7 A. M.	101 1-5	102	
9 "	101 3-5	105	
11 "	101 4-5	106 2-5	
1 P. M.	101 4-5	106 2-5	
3 "	101 2-5	102 4-5	

No. 5 not destroyed.

Post-mortem of Cow No. 6. Small tubercular deposits were found in left lung and also in mammary gland and right ovary.

COW No. 7.	
January 8th, 7 P. M.	101 1-5
10 "	101 1-5
Injected at this time.	
January 9th, 7 A. M.	101 4-5
9 "	102
11 "	103 1-5
1 P. M.	105 1-5
3 "	103 3-5

Post-mortem of Cow No. 7. Only one tubercular nodule could be found and this was deeply seated in right lung.

Nos. 4 and 5 will be tried again in the future.

The conclusions to be drawn from these cases are, that tuberculin is a most delicate test, as the lesions in Nos. 4, 6 and 7 were so slight that it was impossible to detect their presence by physical examination.

GLYCOSURIA PRODUCED EXPERIMENTALLY IN ANIMALS
BY PHYSICAL EXCITATIONS.*

BY PAUL GIBIER, M.D., Director of the New York Pasteur Institute.

Physiologists have produced hyperglycæmia, glycosuria, and even fatal diabetes mellitus, by various processes, such as irritation of the floor of the fourth ventricle (Cl. Bernard), of different portions of the brain, spinal cord, spinal and sympathetic nerves, (Schiff, Pavy, Aladoff and Cyon, Eckhard, Klebs and Munck, Filehne, Vulpian, &c.), intoxication or poisoning by means of substances too numerous to enumerate, but foremost among which phloridizine may be mentioned (Von Mering), traumatism of the skull, and excision of the pancreas (Von Mering and Minkowski, Lépine and Hédon, A. Chauveau and Kauffman).

Glycosuria may also appear spontaneously in animals and cause death, but in such cases the etiology of the disease appears to be, if possible, still more obscure than it is in man. In the latter, it is admitted that glycosuria may appear under the influence of numerous causes; as in lesions of the nervous system, the liver and the pancreas; traumatism, intoxications, or poisoning, and disorder of nutrition. Without discussing the opinions of theorists on diabetes, who have proposed many classifications of this disease, one that it is generally admitted that glucose may be directed in the urine of man after certain mental disturbances, as, for instance, on the eve of a dreaded surgical operation, after great worry, the loss of a fortune by ruined financiers, whose hygienic state is generally favorable to the disease. In short, the influence of any violent moral commotion, of variable duration, predisposes the victims to this affection, and without appreciable prodromata, glycosuria takes root and often completes the destruction inaugurated by anxiety.

If analogous instances have been observed in animals, I have been unable to find any reports in the literature of the subject.

*Read before the Biological Section of the N. Y. Academy of Sciences, April 9, 1894.

For this reason, I consider the following observation, which I made in the course of researches on diabetes mellitus, as sufficiently interesting to lay it before the Academy.

Experiment.—A female dog, aged about 4 years, was placed under observation while at liberty with the other dogs utilized in the laboratory of the Institute. Its urine, tested repeatedly for sugar, for several successive days, gave no reaction with the cupro-potassic, or Fehling's fluid, and when decolorized and examined, with the polariscope there was no deviation of light. When this dog, which is of an affectionate, timid and jealous nature, is placed in its cage alone, it whines continually, and when it sees the other dogs enjoying liberty, its cries become unbearable.

When the dog was shut up on the first occasion its urine gave no reaction for three days, but on the evening of the fourth day, it contained 5.55 per 1.000 of Glucose as demonstrated by Fehling's fluid and the polariscope. The Glycosuria persisted as long as the captivity, but, on the day after the dog was set free, the sugar disappeared.

The same experiment was repeated six times on this dog with the same results, viz., that, after four, three and even two days of incarceration, glycosuria appeared, while it disappeared (after one, two or three days) when the prisoner was allowed to enjoy liberty and the company of the other dogs. The quantity of glucose was 6.66 in one of the experiments, 8.88 in another, and in a third it was 25 per thousand, a very high ratio compared with that observed generally in animals affected with diabetes.

Glycosuria did not occur when the animal was shut in with a companion. No comparison was made with regard to the quantity of urine, drink and food.

The experiment tried with another female dog of seemingly apathetic nature, gave negative results.

This fact demonstrates that some animals, like man, are susceptible of being affected with glycosuria under the influence of physical excitation. To my mind the deduction which may be drawn from this fact is that the experimenters who attempt to

produce diabetes mellitus in animals by operations should take the emotional factor into consideration, and to remember that vivisection may sometimes affect the animal as much in its psychical entity, as in its material body.

Again, enlightened by this observation, we may be able to ascribe some cases of apparently spontaneous diabetes in the dog, ape, horse, etc., to the influence of various psychical causes, as change of condition or residence, the loss of a dear companion or beloved master, captivity, etc.

Certain philosophical considerations may also be deduced from the existence of this common link between the inferior order of emotions of man, and those of the lower animals, but those interested in moral or intellectual problems need not be solicited to reflect upon this aspect of the subject.

HOMOEOPATHY APPLIED TO VETERINARY MEDICINE.

BY F. B. CARLETON, M.D.V.

A paper read before the Massachusetts Veterinary Association.

MR. PRESIDENT AND GENTLEMEN:—When I received a note from our secretary, reminding me that a paper was expected from me to-night, I had forgotten that twelve months ago I had promised one, consequently I had made no attempt at preparing. So, on the plea of lack of time, and the fact that the subject was not of my own choosing, but suggested by Dr. Peters, I ask you to excuse my short-comings, and perhaps you may get an idea or two from what I am to read, the subject having at least the recommendation of novelty.

As some of you are aware, about fifteen months ago I gave up my veterinary practice in order to study human medicine, and desiring some knowledge of homœopathy, I entered the Boston University School of Medicine as a candidate for the degree of M.D. What little I have to say will be largely taken from the work of others, my own experience necessarily having been rather limited.

At first let me give briefly the history of homœopathy, and the principle which underlies the application of medicines under the law of *similia similibus curantur*.

The founder or the school was Samuel Hahnemann, a German physician, who, late in the eighteenth century, while experimenting with cinchona bark, discovered its power to produce certain symptoms similar to those existing in diseases for whose cure it was administered. The idea that he had discovered a universal law flashed upon him, and he proceeded to "prove" various other substances, and to bring into prominence medicine whose therapeutic virtues had not previously been known.

As you are doubtless aware, "proving" substance consists in administering to a number of healthy persons some substance the nature of which is to them unknown, and noting the effect produced. It is customary to give one or more of the provers some innocuous substance, in order that symptoms due to the imagination may be eliminated.

Under the law of similars, the remedy would be useful in the cure of a disease the symptoms of which resemble those produced in the provers.

Remember now that homœopathy does not necessarily imply infinitesimal doses, although a good many of that school do believe that they can effect cures with quantities of drugs so small that our imagination cannot reach them. Be that as it may, the homœopathic idea is not large dose of a remedy, nor small dose, but the right remedy.

And now we come to a brief discussion of a number of remedies. Colocynth, the bitter cucumber, as many of you will testify, has in its proving the following symptoms: Intermittent, colicky and increasing spasmodic pains, accompanied by a cold sweat, and relieved by hard pressure, very severe while the paroxysms last, but the intermissions are free from pain. Colocynth will almost immediately relieve a case with the above symptoms, as I have demonstrated to my own satisfaction in several cases of spasmodic colic. The pain should be purely a

neuralgic one, and not due to any organic lesion in order to have colocynth of avail.

Aloes, with which you are all familiar as a cathartic, is also useful in cases of diarrhœa not produced by the drug. A case of scouring in which there is some rumbling of the bowels, pain before passage of fæces, which escape without effort and accompanied by a good deal of flatus, and more or less straining when the rectum is empty,—such a case would probably yield to aloes. I can personally recommend aloes in hæmorrhoids both in man and beast. It will be found useful in various inflammations of the large intestines and especially in congestive diseases of the anus and rectum.

Nux vomica, which in its provings was found to produce constipation, gastralgia and dyspepsia as a few of its symptoms, is an exceedingly important member in the homœopathic materia medica. Unfortunately for us, it acts more powerfully on the carnivora than on the herbivorous animals; still it is by no means without value in veterinary practice. It is of use in colic from over-eating, accompanied by constipation and frequent, ineffectual attempts to pass manure. It is of value in dogs who are over-fed, constipated and have insufficient exercise, but remember that no inflammation of the mucous surface should exist if it is desired to use nux.

This is one of the many remedies that is used homœopathically by the old school, who prescribe it, or its alkaloid strychnia, in small doses in sick-headache or migraine cardialgia and gastralgia.

In my own experience it has seemed indicated in the following: In the case of torpidity in the bowel of a horse; 2, in a so-called fitty horse, whose trouble appeared to me to be caused by indigestion; 3, and 4, in two cases of gastric disturbance in dogs, both accompanied by constipation, fever and want of appetite, and one of which was rather severe.

In all of the above the treatment was eminently successful, the administration of the nux vomica being followed by recovery, and that rather soon. Of course the animals might

have recovered anyhow, but that is something one might say about any case and whatever the treatment, excepting, of course, in surgery.

Belladonna is well known to you. That, again, is a drug which doubtless you all have used homœopathically. Take one instance only, that of pharyngitis. Belladonna has in its proving the same inflamed, dry, sore-throat for which we are in the habit of prescribing it. In conjunctivitis and various other inflammations of the eye it is widely used.

Its sphere is almost unlimited, and it would be useless for me to do more than mention it. In one case of a horse subject to fits, as the owner said, I used it for two weeks, reducing the number of attacks from one or more daily to one during the fortnight. Unfortunately, I left the place then, and am unable to state whether a permanent cure resulted.

In the *Medical Advance* for October, 1893, are reported a number of cases from which I shall quote, in all of which the treatment was successful.

Rhus toxicodendron, the sumach or poison oak, was used in case of a horse lame forward. *Conium*, or hemlock, was used in several cases of azoturia. As far as I can find out, *conium* is homœopathic to the paralysis of the disease. As azoturia may, and often does result fatally, it strikes me that *conium* is well worth a trial.

Pneumonia with phosphorus for a remedy, glonoin or nitroglycerin was given to a horse with blind staggers.

Kali carb., carbonate of potash in leucorrhœa in bitch with general inflammation of the genitalia.

Arsenic in diarrhœa in an ox and in chicken cholera.

What I have said will be a nucleus on which to build to those of you who are at all interested in the subject. Remember that I have merely touched on a very few of the drugs which are in daily use by homœopathists. My knowledge of the subject is very limited, but the more time I give to it the more I am convinced that on the whole it is the most rational system of medicine known at the present day. I can only say, don't

condemn it until you have given it careful study and trial. I was, a few years ago, as sceptical in regard to homœopathy as any of you, but reflection, study and actual practice have convinced me that curable diseases can be cured more easily and quickly by a rational homœopathy than by any other known method. And if this be true of men, why not apply the principle to veterinary practice?

PURPURA HÆMORRHAGICA—OEDEMA, ANASARCA, ETC.

By H. E. SPENCER, D.V.S., San Jose, Cal.

A paper read before the California Veterinary Medical Association.

In response to the chair, I have prepared a paper on the above subject, not with the idea that I could enlighten you gentlemen on this disease, but with the hope that something would be learned by the exchange of ideas that the discussion of this paper would bring forth.

I have been singularly fortunate in the treatment of this disease, having not lost a case of it in two years, save one that was taken out of my charge on the second day and given over to the tender mercies of the groom. And I have treated a great many, as our locality seems to be a hot-bed for influenza, catarrhal fever, pyogenic fever, or, as it is commonly called, distemper.

Purpura hæmorrhagica is due to a paralysis of the vasomotor nerves which govern the circulation in the smaller blood-vessels and capillaries, and also to an altered condition of the blood, the red blood corpuscles being smaller and shriveled in appearance, as though treated to the action of ammonia; the white blood corpuscles are increased in number, and there is an excess of the aqueous portion, causing the coagulability of the blood to be greatly lessened.

Purpura usually follows some debilitating disease, as influenza, but has been known when it was due to unsanitary surroundings and poor provender. It usually follows a slight attack of catarrhal fever when the horse has made a rapid recovery, the exciting cause being usually exposure to cold,

generally exposure to cold draughts of air on a heated but not necessarily sweaty body, exposure to rain being more liable to cause pneumonia, pleurisy, etc.

Semiology.—The symptoms of this disease are quite variable, but upon examination of the tongue you will notice a purple or claret color, later petechia will appear on the Schneiderian membrane, and often in the mouth along the lingual gutter, and on the frænum; then swellings appear around the nostrils, on the neck, belly and legs. These tumors are peculiar to this disease; they are about the size of a hen's egg, well defined, the edges being very abrupt, pitting slightly on pressure, and are but slightly sensitive to the touch. They usually disappear and come again in twelve hours, but do not always appear in the same location as before, growing rapidly larger and coalescing until the legs are twice their normal size, the belly swollen from two to four inches, the line of swelling very abrupt as though a ligature had been fastened around, and the animal becomes very stiff and sore from the swelling around the joints. The head sometimes swells to an enormous size, especially about the inferior maxillary, making the animal resemble a hippopotamus more than a horse, and inconveniencing him greatly when feeding. The effusion around the glottis and nostrils sometimes renders breathing difficult. Thus far the temperature is but slightly elevated, if at all, the pulse normal, or perhaps only a little weaker; respiration is not altered if the œdema does not diminish the caliber of the nostrils or the glottis. The appetite is usually good and the animal seems to be in good spirits, but does not move much on account of the swellings around the articulations. After three or four days there appears a serous exudate of the skin over the œdematous parts that loosens the epidermis, which dries up and cracks; if this exudate is very extensive there will be ulcerated spots on the skin, the petechia on the Schneiderian membrane acting as an irritant and producing catarrhal discharge. There may or may not be swelling of the lymphatic glands from absorption of the exudate. The temperature now may be slightly elevated, the pulse and respir-

ations accelerated, the appetite usually good, or may be precarious. The rise in the temperature, when it occurs, is caused by septic poisoning, and at this stage there may be sloughing of the skin from the great pressure on it, or from poor circulation through it, or gangrene may occur from the same cause. In this case it leaves a large ulcerous sore. Metastasis often occurs; the swelling which has been in the legs and belly suddenly leaves and appears in the head, causing great dyspnœa, and it would seem as though tracheotomy would be necessary, but the animal will almost always die from septicæmia if tracheotomy is performed; or the swelling may disappear and produce intestinal œdema, which is manifested by great abdominal pain, and usually produces death, or it may terminate in an exhaustive diarrhœa, which is hæmorrhagic in nature; or it may produce pulmonary œdema, in which case there would be marked dyspnœa without swelling of the head; this would indicate metastasis into the parenchyma of the lung, showing a dullness on percussion and râles by auscultation. This usually produces death by asphyxia or asthenia. Septicæmia is very often the cause of death, especially if there be any sores or wounds on the animal, the symptoms being those of septicæmia (rise in temperature, rigors, hurried breathing, fast, weak, wiry pulse, etc).

The prognosis must always be guarded, as an apparently benign case at first may prove fatal in a very short time while a very severe case may terminate by resolution in a few days.

Treatment.—Medicines must be used to alter the blood,—to produce fibrin factors and more red blood corpuscles, and reduce the watery portions. My line of treatment is usually potassium chloride in half-ounce doses to produce fibrin factors and reduce the watery portions, iron to stimulate the production of red blood corpuscles, ergot to regulate or give tone to the blood-vessels, and quinine as a tonic. I also use showers of cold water on the œdematous parts to produce a shock to the vaso-motor system controlling the blood-vessels.

A BACTERIOLOGICAL STUDY OF EQUINE FISTULAE.

By C. M. DAY.

A paper read before the Iowa State Veterinary Medical Association.

Since the general acceptance of the doctrine that the presence of certain parasitic microbes is an essential feature of the suppurative process we can no longer be satisfied to refer Poll-evil and fistulous withers to traumatism only, but must in this, as in every other instance, apply the methods of bacteriological analysis. These conditions are peculiar to the equine species, and from their seriousness, frequency and intractability are of great practical importance. This study has been made to the extent of identification of the species and virulence of some micro-organisms found in the pathological elements from the cases mentioned.

The part of the animal economy generally known as the poll is the region immediately behind the ears, on the superior part of the neck. The skin very thick on the median line, thinner on the sides, with a thick layer of connective tissue, more or less infiltrated with fat, just beneath; the cord of the ligamentum nuchæ, which is attached to the occipital bone and more or less covered with the cervico auricularis muscle on each side, and on the same level the terminal insertion of the splenius muscles, forming an elevation which is covered with the aponeurosis common to that muscle, and the small complexus which makes an apparatus of retention of great resistance to the organs of the region; another layer, composed of the large tendon of the great complexus, the small oblique muscle of the head, the great oblique, and under them the posterior great muscles of the head, a serous sac, assisting the gliding of the cord of the ligamentum nuchæ over the atlas, and finally a skeleton of the region, atlas, axis, occipital crest and the occipito-atloid and the atlo-axoid articulations. These are the principal anatomical features of this region.

The withers is the part of an animal just posterior to the cervical region. It is formed by the superior spinous processes

of the dorsal vertebræ and the muscles which cover them. The skin lined inside with cellular tissue, more condensed toward the median line than on the sides, where it is loose, the trapezius muscle thick and muscular in its upper portion, where it lies over the external surface of the scapula, and its cartilage of prolongation, thin and aponeurotic inferiorly; the rhomboideus muscle, which is separated from the second plane on its external surface by a layer of loose cellular tissue, and is lined on its external face with a yellow elastic band inserted on the inner face of the cartilage of prolongation of the scapula (this band is especially liable to attacks of necrosis); the superior portion of the anterior small serratus muscle, which is formed by a broad aponeurosis attached to the superior extremity of the spinous processes of the vertebræ, the anterior portion of the ilio spinalis muscle; the deepest of these planes resting on the faces of the long spinous processes of the vertebræ is formed by the transverse spinal muscles of the back.

The Poll-evil is a fistulous ulcer, situated on the superoposterior portion of the head, immediately behind the ears. At first it may be recognized as a soft, fluctuating tumor, surrounded by an inflammatory swelling, with enlargement of the superior cervical lymphatics and the superficial veins of the neck.

The tumor that can be felt may be a cyst filled with serum, or it may be filled with a purulent substance, just as the case may happen to remain aseptic, or become infected with micro-organisms; if a serous cyst is formed it may become infected during formation by micro-organisms entering the serum which forms or makes up the cyst.

Fistulous withers resembles Poll-evil in every particular except its location.

If we get the anatomy clearly in our minds, we will have a good idea of the intricate disposition of its many parts, with their relation to the disease which attacks them, and it also explains the tendency of the purulent material gravitating and collecting between the muscles, and contributing to the formation of the ailment known as a true "diseased withers," with

the habitual severity with which it is characterized. Thus there may be a pre-disposition to disease of the poll and withers by a defective anatomical conformation of the regions.

The Poll and withers are portions of the animal which are considered by a great many to be a location most exposed to injury, and for this reason alone we are prone to believe in the old theory of traumatism as the cause of Poll-evil and fistula.

We find it quite plausible, and believe that injury to the parts is the factor in the location of the disease in a great many cases.

The history of a great many cases shows that the parts have been injured at some previous time, after which the owner or groom of the animal noticed the development of an abscess. But how shall we account for the large number of cases of which we have no history nor evidence of previous injury?

On looking over the entire anatomy of the animal, we find other regions equally exposed to injury, the hip or external angle of the ilium, for instance, is more especially liable to injury, the animal frequently striking it against the barn-door in passing out and in the barn, or against the partition when confined in a narrow stall, especially when lying down; neither can the animal roll without bringing the parts violently in contact with the ground; but it is seldom, indeed, if ever we see a fistula on that region. The backband of the harness, which has been so invariably blamed for chafing and irritating the withers sufficiently to cause disease, sits day after day on muscles of the back without causing injury; the top of the neck and shoulders are pressed upon and irritated daily, maybe, with some ill-fitting collar or neck-gear, yet we seldom, if ever, see a fistula occurring on those parts. The animal may be bruised severely in many ways on various parts of the body, yet we seldom see fistulous tracts arising from the injury.

Why is it, then, we so frequently see this serious condition occurring on the poll and withers? Can we believe it always to be due to an injury when other parts of the animal daily receive equally as severe injuries without producing these results? Or

can we, by considering the complex anatomy of these parts, and, with our knowledge of bacteriology, conceive its being the work of micro-organisms in those parts? Hertwig said, "Poll-evil may occur without any local injury." For this and many other reasons the researches of science are aroused to study the etiology of Poll-evil and fistula from a bacteriological standpoint, with a view of connecting the disease with bacteria and placing it in the category of bacterial diseases.

The old theory of traumatism, we think, has become too vague and unsatisfactory to satisfy the scientific mind and keep pace with the rapid advancement in all other branches of veterinary medical science.

Science has discovered and proved beyond a doubt in the last few years that bacteria play a most active part in the etiology of a great many diseases, just as there have been wonderful discoveries in the last few years in regard to the causes of disease, so there will be still more advancement in that direction. Therefore, the scientific workers of the present time should feel it their duty, and work as hard to reveal the mysteries which surround some of the ills which man and animals are heir to.

In the study of bacteriology we find pathogenic organisms getting into the animal system in several ways, and causing severe and dangerous trouble—causing abscesses in various parts of the animal, also giving rise to diseases known as pyæmia and septicæmia.

Pathogenic organisms are divided into two distinct classes—specific and non-specific.

The specific are always followed by the same disorder under whatever circumstances they occur.

The non-specific ones, according to modes of infection and the condition of the tissues, give rise to a variety of diseases—suppuration with its sometime consequences, pyæmia and septicæmia. It is an open question whether suppuration can occur from merely mechanical or chemical irritants, however persistently they act. Ogston was the first to show as a matter of

fact that certain forms of organisms are invariably present, staphylococci and streptococci, in acute abscesses, whatever share they take in their causation. They enter either through a wound, mucous membrane or skin, and travel by means of the lymphatics or blood-vessels.

Staphylococci lead to circumscribed abscesses; streptococci spread by the lymphatics and are followed by diffuse suppuration. Suppuration cannot occur without pyogenic organisms just as tubercle cannot occur without its specific bacillus.

When nutrition of the tissues is impaired by prolonged residence in foul air, or during convalescence from exhaustive disease, suppuration occurs without local injury; the capillaries may become plugged with micro-organisms at some point, and the walls of the vessels are then the first to perish and melt away. Aided by the hyperæmic condition of the parts, the germs remain sufficiently powerful to continue the destruction in the direction of least resistance.

If these germs are slow in their action or do not invade a very extensive area, nature tries to protect the system against the invading organisms and their ptomaines by throwing a sheet of tough fibrous tissue around the pus formed to prevent the organisms and their products from entering the general system and causing general infection. But, when the streptococci pyogeneus gains early access to the lymphatic spaces and spreads through them before the tissues can resist, a resisting membrane is never formed and suppuration is diffuse; the tissues are so reduced in strength they disappear before the invading germs, unable to protect themselves with a barrier of any kind.

Diffuse suppuration is only met with when the action of the germs are very intense, or the resisting power of the tissues is exceedingly feeble and is associated with both streptococci and staphylococci. Sometimes, owing to the presence of dense sheets of fascia, the pus spreads laterally for a distance among the tissues, but sooner or later its course turns towards the surface, the skin, or mucous membrane, as the case may be, gives way and the abscess breaks and discharges its contents.

The extent of the changes in the tissue depends on the condition of the tissue and the virulence of the pus-organism. The tissues, in their endeavor to limit the action of the irritant, always produce the same exudation, but the change this undergoes under the influence of different irritants, and under different conditions, naturally differs and gives rise to different diseases. Suppuration is a complication due to the action of certain micro-organisms. Most of the pathogenic bacteria under ordinary circumstances do not reproduce themselves outside the body, but their resistance to heat and cold, moisture and dryness, is so great that they retain their disease-producing qualities often for an indefinite period of time, and after their entrance into the body, meeting with a proper nutrient medium, they exert their specific pathogenic effects.

We have now taken into account the complex anatomy of the parts, the large congregated mass of muscular and cellular tissue with broad tough sheets of fascia lying between, making the most favorable place for the action of the microbes and the formation of pus. We have also studied the action and effect of the micro-organisms on the tissue.

We may now consider the susceptibility of the parts to the action of the pus-organisms; also the action of the organisms on those parts.

The respective location of these parts on the animal makes the blood circulate slowly, therefore making the capillaries and small blood-vessels very liable to become plugged with the organisms, causing stasis and the result usually following it.

The large amount of loose cellular tissue in these parts also makes them more susceptible to the action of the organisms. The action or result of the organisms are to set up a point of irritation, causing inflammation and breaking down of the tissues into pus cells by the ptomaines which they produce.

September 1, 1893. Case No. 1.—The animal was six years old and had been used for general work. It presented a considerable swelling on the right side, extending far back on the withers. The case had no history of injury to the parts, but

withers had been affected one year before and had been operated on at two previous occasions; first, on the left side at a time unknown, and on the right side about the 1st of July, when it discharged serum. The wounds from both operations, however, had entirely healed, and withers again presented their normal appearance until about one week previous to making cultures when they commenced to swell again. After washing the surface with a solution of chloral and soda a sterilized trocar was inserted about twelve inches posterior to the previous opening on right side, and a considerable amount of serum drawn off. Some of the serum was collected in a Sternberg glass bulb and in sterilized test tubes plugged with cotton, and saved for future use in the laboratory. Stab cultures were also made on agar-agar, gelatin, blood serum and bouillon directly from serum escaping from trocar. After seven or eight days the tubes were examined but no growths appeared. The conclusions are the case was a serous cyst perfectly free from micro-organisms of any kind.

September 1, 1893.—Case No. 2 was a sorrel pony, eight years old, without history of previous violence or injury being inflicted. The pony first showed lameness in left fore-limb about the 1st of June, 1893. After a short time a swelling appeared on left side of withers, which grew to be quite large, very tender and sensitive to the touch. On August 29, 1893, the abscess opened without surgical interference and discharged considerable yellow, thick, creamy pus. Cultures were made on September 1, 1893, on gelatin, agar-agar and blood serum. A very vigorous growth appeared on the agar-agar and gelatin tubes, blood serum being sterile. Examination with a microscope showed the growth to be pure culture of *bacillus pyogenes foetidus*.

September 29, 1893. Experiment No. 1.—Inoculated a mouse at root of tail; mouse died in twenty-four hours. An autopsy was held, but no pus was formed at seat of inoculation. Cultures were made from liver and heart blood, and some germ obtained that was used for the inoculation.

October 4, 1893. Experiment No. 3.—Injected 2 drachms of bouillon cultures, thirty-six days old, into the muscles on the neck, just anterior to the cervical angle of the scapular, of a horse bought for dissection. October 19th considerable swelling around point of inoculation, very tender and sensitive to the touch; swelling remained large and sensitive until October 25th, when the animal was destroyed and the parts dissected out. I found a cavity filled with a light-colored serous substance which, on examination with microscope, was found to contain pus corpuscles; it was evident that some of the tissue had broken down and a true abscess had formed. Cultures were made directly from the newly-formed abscess on agar-agar and potato; the growth which resulted was same as original.

September 2, 1893.—Case No. 3 was a horse eight years old which had Poll-evil. The abscess had been lanced six days previous to making cultures, and was discharging a thick, yellow, creamy-like, odorless pus. The history of the case could not be obtained. Cultures were made on agar-agar, gelatin and blood serum. A vigorous growth appeared on agar-agar tubes. On examination with the microscope, found it was a bacillus, but failed to identify it further.

November 10, 1893. Experiment No. 1.—A mouse was inoculated with some of the original cultures; an abscess formed in thirteen days about middle of tail; no pus at seat of inoculation. November 17th made cultures from abscess on agar-agar, gelatin, potato and bouillon, and had no trouble in obtaining the same characteristic growth as the original.

September 2, 1893.—Case No. 4 was a bay mare, six years old, with a fistula on right side of the withers. The early history of the case could not be obtained. The abscess had been lanced seven days previous to our observation, and was discharging a thick, yellow, creamy-like odorless pus. Stab cultures were made on gelatin, agar-agar and blood serum.

After remaining several days in the laboratory at the room-temperature a vigorous growth appeared in the agar-agar tubes, the gelatin and blood serum tubes being sterile. November

20, 1893, a mouse was inoculated with some of the growth on agar-agar; mouse died in about thirty-six hours; cultures were made from heart, blood and liver, and same germ obtained as in original.

September 2, 1893. Case No. 5.—Fistula in a bay colt three years old which had never worked; no history of previous injury of the parts. The abscess made its appearance about three months before inoculations were made, withers swelled a great deal; abscess broke on right side, discharged pus and swelling went down on this side but remained large on the left side. After closely clipping the hair over the swelling on the left side, and washing surface with a solution of bichloride of mercury 1 to 500, the abscess was lanced and a small amount of serum and pus escaped. Some of this was collected in a Sternberg bulb, and saved for future use in the laboratory; cultures were made on agar-agar, blood serum and gelatin directly from abscess, and Esmarch rolled tubes were made in the laboratory from contents of bulb, but no growth appeared in them. The stab cultures on agar-agar and on blood serum were also sterile, but a slight growth appeared in the gelatin tube, and some transfer cultures were made from it. On examination of the germ with a microscope, and after growing it on several media, it was found to be the staphylococcus pyogenus citrius. The germ was pathogenic as the following experiment shows. October 26, 1893, inoculated a mouse at root of tail with growth on potato; mouse died in about eighteen hours; no pus formed at the seat of inoculation. Post-mortem was held, and stab cultures made from liver and heart blood which developed same organism.

Case No. 6 was a colt three years old, which had never been worked. Presented a considerable swelling on both sides of withers without any history of injury. The swelling on the left side had been blistered with a blistering ointment. After clipping the hair and washing the surface with a solution of corrosive sublimate, about 1 to 500, the swelling on the left side was lanced. From the pus and blood which escaped stab cultures

were made on agar-agar, gelatin and blood serum. Some of the escaping pus and blood was collected in a Sternberg glass bulb and saved for making cultures in the laboratory. After remaining for six days in the laboratory at the room-temperature, very vigorous growths appeared on agar-agar; on examination this growth was found to consist of the *sarcina lutea* and the *staphylococcus pyogenus aureus*. Experiments were made on a horse and several mice to determine their virulence, and both germs were found to be pathogenic as the following experiment will show.

September 12, 1893. Experiment No. 1.—Injected 1 drachm of bouillon culture four days old of the *sarcina lutea* into the muscles of the neck of a horse, bought for dissection, a few inches anterior to the cervical angle of the scapula. The case was daily examined but no abscess was found, no signs of irritation.

September 26, 1893. Experiment No. 2.—Injected about 2 drachms of bouillon culture eighteen days old into the muscles of the neck of another horse, in about the same location as the previous case, but was again unable to produce an abscess.

September 14, 1893. Experiment No. 3.—Mouse inoculated at root of tail with some of the growth on agar-agar (*sarcina lutea*); mouse died in about twenty-four hours; cultures made from liver and heart blood developed the same characteristic growth. No abscess was formed at seat of inoculation nor in any part of the body that could be detected on dissection.

September 29, 1893. Experiment No. 4.—Mouse No. 2 was inoculated at root of tail with the *staphylococcus pyogenus citreus* grown on agar-agar; mouse died in about twenty-four hours; autopsy was held but found no pus, and no abscess was formed at seat of inoculation. Made cultures from liver and heart blood on agar-agar, and obtained some characteristic growth as original.

October 4, 1893. Experiment No. 5.—Growth from liver of mouse No. 2 was inoculated into mouse No. 3 at root of tail. The mouse did not die, but an abscess was formed at seat of

inoculation in about six weeks. On October 17, 1893, a large scab was lifted and cultures made from the pus and the same germ was obtained.

September 13, 1893.—Case No. 7 was a gray mare, six years old, brought to college hospital for treatment, with fistula on neck just anterior to shoulder. The history of the animal showed she had been affected with strangles in the spring of 1893, and several abscesses formed on the animal which broke and discharged pus, all of which healed except one on the neck, which remained open and continued to discharge pus through a fistulous opening. Cultures were made on gelatin, agar-agar and bouillon. After remaining for three days in the laboratory at room-temperature, vigorous growths appeared on all the tubes. On examination the staphylococcus pyogenus aureus in pure culture was found in all the tubes. It was quite virulent as the following experiments will show.

September 29, 1893. Experiment No. 1.—Inoculated mouse with growth from agar-agar tube; mouse died in about twenty-four hours. Autopsy was held and inoculations made from liver and heart blood, also cover glass preparations made from heart blood. Cultivations from heart blood produced same germ. In cover glass preparations the staphylococci could be seen with microscope.

October 4, 1893. Experiment No. 2.—With the growth on agar-agar from heart blood of first mouse, a second mouse was inoculated which died at end of four days. Cultivations were made from liver and heart blood and same germ cultivated. No pus at seat of inoculation.

October 6, 1893. Experiment No. 3.—Inoculated a dissecting case (horse) on the neck, just a few inches anterior to the cervical angle of the scapula, with about 6 drachms of bouillon culture twenty-four days old. On the following day, October 7th, a considerable swelling appeared, very tender to the touch. October 8th, swelling much larger and more tender and sensitive. October 9th swelling about the same; tenderness remains. October 10th swelling about the same, quite tender yet. October

11th swelling going down, not so tender to the touch. From this time the swelling gradually went down until it got the size of a tea saucer, and tenderness gradually disappeared until October 25th when, the animal being killed for dissection, we dissected it out and found a number of small cavities filled with a thin yellowish-colored fluid, which, on microscopical examination was found to contain pus cells. Cultures were made from the abscess thus formed, and same characteristic growth was obtained; also some cover glass preparations were made which showed, on examination with the microscope, the same bacillus as original.

From the foregoing experiments the conclusions are that a great number of germs are present in a case of Poll-evil or fistula which has been opened and exposed to the air; a number also in abscesses which never have been opened, the parts having become infected from within by pus germs having sufficient virulence to cause an abscess.

Reference.—W. Williams, Surgery; Liautard, Surgery; N. Senn, Surgical Bacteriology; Sternberg, Surgical Bacteriology; Crookshank, Surgical Bacteriology.

The work of this thesis was done under the immediate supervision of Dr. W. N. Niles, Assistant Professor of Veterinary Medical Science, in his laboratory at the Iowa Agricultural College, Ames, Iowa.

I wish to thank Dr. George J. Howell and Dr. A. B. Morse of Des Moines, Iowa, for their kind assistance in helping me to material for the study of this subject.

THE AGRICULTURAL ASPECT OF TUBERCULOSIS.

By SESSIONS, Sec'y State Board Agriculture.

A paper read before the Massachusetts State Veterinary Medical Association.

It is but a few years since tuberculosis in cattle was known to the public to be prevalent. The attention of scientists, particularly of veterinarians, has lately been directed to the disease as a source of danger to the life and health of the human fam-

ily. Investigations have proved the disease to be generally prevalent among the cattle in all thickly inhabited countries although most of the cattle affected show few outward indications of the disease. In fact, a large majority of such infected animals are apparently healthy, and the presence of the disease cannot be detected with certainty without the use of tuberculin.

The danger to human life and health has been discussed and magnified until the public are demanding action, by the State authorities, for their protection. Authority has been given the Cattle Commissioners to kill, without appraisal, all cattle found to be affected with the disease.

The discovery that the injection of tuberculin is a very reliable method of detecting the disease, has led many to believe that this should be applied by the authorities to all suspected herds, and some people are of the opinion that all the cattle of the State should be subjected to this test. From the experience thus far had in the use of tuberculin, we are led to believe that a large proportion of the cattle that are apparently healthy would be condemned by this test. The present law provides no recompense to the owner of such cattle. These conditions make the agricultural aspect of tuberculosis very serious indeed.

The neat stock of the State is rapidly decreasing, the decrease having begun with the agitation of the danger from tuberculosis. In 1890 200,658 cows and 62,549 neat cattle other than cows were assessed. In 1893 85,806 cows and 47,528 neat cattle other than cows were assessed, a decrease on 13,852 in cows and of 15,021 in other neat cattle, making a total decrease of 28,873 in three years. The number of cows had been previously quite steadily increasing for thirty years from 149,090 in 1861 to 200,658 in 1890.

The dairy is easily the most important branch of farming in Massachusetts. The State census of 1885 gives us the latest reliable figures. By that the value of dairy products was \$13,080,526; hay, \$9,676,893; other staple product, \$4,578,763;

fruit, \$2,386,290; vegetables (potatoes are included in staple products), \$2,762,941; animal products, \$5,398,439. The hay crop is quite largely dependent upon the dairy interest and the animal products are so largely dependent upon the dairy as to be almost a part of it. The veal product is certainly a dairy product, and most of the veal of the State is grown on the skim milk of our dairies.

If the killing of tuberculous animals is to go on without compensation to the owners this most important industry must rapidly decrease, carrying along with this decrease a still greater decrease in the value of much of the farming property of the State. The fine dairy barns that dot the farms of the State will become valueless and the pastures will be allowed to grow up to brush. The State can ill afford a decrease in its agriculture and in its agricultural population. If the fight against tuberculosis is for the public good, the public should make part at least of the sacrifice deemed necessary. Especially is this proper in view of the fact that many cases of tuberculosis in human subjects do not terminate fatally and many apparently recover. I quote from "Tuberculosis in Relation to Animal Industry and Public Health," by Dr. James Law. "Dr. Biggs tells us that in the Charity Hospital of the city (New York) 30% of all deaths show old lesions of tuberculosis now become stationary. He quotes a Vienna hospital pathologist to the effect that he finds similar old stationary lesions in 85% of all post-mortem examinations. This leaves but 15% who have not suffered from tuberculosis." It is not too much to claim that a like proportion of bovines slightly affected with tuberculosis would never be apparently injured by it. Such cases should be paid for in full if sacrificed for the public good. But it would be difficult for the officials to discriminate in the matter of allowance for cattle killed, and so it would probably be better to fix upon a portion of the value of the animal in health as the amount that should be paid to the owner of an animal condemned to destruction because infected with tuberculosis. I believe the owners of neat cattle, as a class, are unwilling

to bear all the burden. They believe that if the public takes arbitrary possession of their property and destroys it, that an equitable portion of its value should be returned to them. In view of all that we know about tuberculosis it cannot be absolutely determined what an equitable proportion is, and the matter must be decided by granting an arbitrary part of the original value.

The value of the animal condemned is but a part of the loss to the owner. His business is broken into; his herd is discredited; his customers are afraid of his product; and if permanent future immunity is to be gained by him, he must be to a large expense in disinfecting his barns and stables. This disinfecting is out of his line but is as necessary to the public health as is the slaughter of infected animals. The State should see that it is properly done, and it could be done cheaper and more certainly by agents of the State than by numerous private owners. Why should not the State provide for this very necessary part of the protection of public health. Dr. Law says in the paper quoted above "Sanitary laws which in any way ignore or disregard the rights of property have within them the seeds of defeat.

"If the stock owner is not fairly reimbursed for his animals slaughtered, and for other losses sustained for the protection of the public health and of the country's herds, unscrupulous men will find ample means of trading off the as yet incipient and occult cases of tuberculosis, thereby planting the infection in new herds. Compensation must stop short of making the sanitary bureau a profitable customer for tuberculous animals at sound prices, but it must be so liberal as to enlist the ready co-operation of the stock owner in having every infected beast safely disposed of."

The State is bound to protect the life and health of the people and is also bound to do justice to all parties. The State is also, for its own good, bound to foster agriculture, for no nation can long continue prosperous without a prosperous agricultural population. A large per cent. of the successful men of our

nation have always been from those born and reared on farms. It must continue to be so. And the more prosperous the rural population is, the larger proportion of able and faithful young men will it furnish for the service of the City, State and Nation.

FISTULA.

BY DR. J. T. NATTRESS, Delavan, Iowa.

A paper read before the Illinois State Veterinary Medical Society.

There are few questions in the whole field of veterinary science of which the young practitioner feels that he knows more, and the older wishes he did know more, than those of fistula. Aside from castration, there is probably no one class of patients with which country practitioners deal more commonly, and none are more disagreeable or more unsatisfactory. We discuss them at every meeting of an association, so do our sister associations, and yet we use about the same old treatment as did our predecessors half a century ago. They are just as dirty and just as disagreeable to treat, they are just as slow in healing and just as liable to recur again.

A thorough discussion in the anatomy concerned in the question of fistula of the cervical and anterior dorsal regions calls for the study of several pairs of muscles, nerves and ligaments, arteries and their associated veins, but will not discuss them minutely, for I trust you are one and all thoroughly acquainted with them and their location, if you have treated any number of fistula. I have no doubt but what you do; in ordinary practice, however, we rarely pay any attention to the small muscles; the larger ones are easily located.

For brevity sake, the blood and nerve supply will be left with the operator. An operator who cares to become an expert in the treatment of these cases must know where those muscles are, their origin, insertion, direction of the fibres and their

function. He must have definite ideas of the location, cause and distribution of the larger blood-vessels and nerves if he would make very deep incisions and punctures, as he sometimes must do. It is very unpleasant to cut the dorsal superior cervical, or even larger branches of the vertebræ, under several inches of muscular tissue. The lymphatic vessels call for some attention in this discussion, because of the special part they play in distributing certain pyogenic microbe bacteria. In external portions of the body they are arranged in two primary sets—superficial and deep.

Etiology.—The next question is that of cause and, like Darwin's first drop of protoplasm, some points are not easily explained. In discussing this subject under the topics of origin, sources from whence these microbes are received, mode of entrance, and factors which determine the location of the pre-fistular abscess, I wish to make the following remarks: That suppuration rarely or never occurs without the presence of pyogenic microbes or their products; that the initial abscess is usually the result of a local auto-infection; that fistula may be indirectly transmissible, due to any one or to a combination of several pyogenic microbes, and, therefore, not specific; that one attack gives no immunity, but predisposes to others; that external injuries may serve to fix their location, but are not to be regarded as primary causes.

Origin, Bacterial.—In the early days of antisepsis, when healing without pus was first demonstrated possible, we received the old dictum, "no micro-organism, no pus." Since those days this question has been argued back and forth by the most eminent writers of the present day. Dr. Senn, in his "Surgical Bacteriology," concludes that pus microbes are the essential causes of suppuration. Some admit that suppuration may occasionally be produced by deep injections of germfrer irritants like silver-nitrate, ammonia and turpentine. But I think the great majority of competent observers hold that the great and common cause is the presence and activity of pyogenic micro-organism in susceptible tissues, and that certain of these organ-

isms may be regarded as specific exciters of suppurative tissue changes.

Infection, Sources.—It is not difficult to enumerate sources from which infection may be received, but it is frequently impossible to prove a specific origin in any individual case. Pyogenic bacteria have a wide diffusion in nature, for they have been demonstrated in air, soil, water and a variety of foods. There is the old question of hereditary transmission, or transmitting living germs, and seems to be gaining ground with plenty of evidence in its favor.

Modes of Entrance.—There are three ways in which micro-organisms usually penetrate into our bodies: 1. From the surface of the skin, generally after it has been injured in some way. It does not, however, indeed always require such a special door of entry (*i. e.*, abrasion). 2. The digestive canal, into which the bacteria pass along with the food; many, it is true, cannot pass through the stomach in their usual form, being destroyed by the action of its acid contents. Other kinds are less sensitive, and when spores are present, or when disease has altered the character of the digestive fluid and weakened its bacteria-killing power, there is no further obstacle to the passage of the parasites. 3. The respiratory organs can afford entrance to the bacteria.

Locating Factors.—After discussing the bacterial origin, sources from which infection may be drawn, and mode of entrance, there remains the query, What determines the location of the pre-fistular abscess? It has long been a matter of dispute whether pathogenic microbes exist in healthy animal tissues. I think the view is gaining general support that such conditions are possible, but that these same microbes do not exhibit their pathogenic properties so long as they remain in circulating blood and every body tissue remains healthy. Then to furnish the requisite conditions under which these pyogenic microbes may exhibit their pathogenic functions, some susceptible tissue must become injured or diseased. The blood, or lymphatic fluid, must be checked in its flow at that point,

thromboses performed, and the microbes be permitted to locate and multiply. In other words, to locate a pre-fistular abscess there must be furnished a *locus minoris usis tentiæ*, which Senn defines as being an area of lesser resistance, due to a tissue injury which so changes the tissue that pathogenic microbes, previously present in the circulation, become arrested and find favorable conditions for multiplication. But recent tissue lesions are not the only factors which may serve to produce such an area of lesser tissue resistance. The presence of old pathological products, exposure, feeble performance of an organic function, and a variety of general and illy-defined factors, seem to produce conditions favorable to local infection.

The regions which fistula usually select are such as are liable to receive blows and bruises, given by angry attendants, received by passing under low sheds, or through low door-ways, or while rolling. Again, the soft tissues of these parts are mainly connective, and connective tissue areas are very prone to chronic suppurative processes and slow healing. Such, then, are the factors which serve to locate suppurative processes. There yet remain many questions regarding the history and work of pyogenic microbes for bacteriologists and chemists to answer. We all wish to know to what depth beyond the surface of a pyogenic membrane do these pus-producing germs reach. *Why does pus burrow?* Is it by pressure and absorption? or is it due to some mysterious part played by the microbes in their effect upon protoplasmic cell contents. We do not know so much as we would wish regarding the tendency of suppurative processes. Fistula sometimes heal rapidly and abscesses develop in the atlo-axoid region.

There are some strange features in such cases. Why do not domestic animals other than solipeds develop fistula?

Treatment.—Many annoying features in the treatment of these cases, which may be well understood and yet difficult to handle, for example, the well-known tendency to recur after indefinite periods of apparent soundness.

The conditions which experience has taught me are necessary to successful treatment are briefly,

1. Free escape of pus.
2. Destruction of the membrane lining old sinuses and cavities.
3. Removal of foreign substances, such as splinters of wood and diseased bone.
4. Establishment of an active granulating process.

The first I strive to gain at any cost. I accomplish such drainage by the knife trocar or cannula, setons of cloth, horse-hair, rubber tubing, shoemaker's linen thread. Sometimes we need a seton that will remain in place for a long period without decay. I have never tried to trephine the scapular, but I believe it can be done with advantage in those cases where a sinus runs down in that region.

In a few cases bottom drainage seems impossible. The only satisfactory substitute with me has been peroxide of hydrogen. Diluted nitric acid, carbolic acid, bichloride mercury, peroxide creoline, and the ordinary white lotion, have proven the most practical antiseptics. The production of active, healthy granulations sometimes call for all the ingenuity a surgeon can muster. Turpentine, common salt solutions, have given good results. Where cases are annoying and persistent, and the discharge nearly ceases, I apply a blister with good results. The only way to get rid of foreign substance is by bold surgery.

NAILS IN FEET.

By JOHN A. BELL, V.S., Watertown, N. Y.

A paper read before the New York State Veterinary Society.

While nails in the feet are quite common in our every day practice I recently had a case which was a little out of the general line. We usually have nail in the foot, but this was nails in the feet, for both hind feet were found to be punctured at one and the same time, or, at least, the injuries were found at the same time. The case was a 1,500 pound horse belonging to one of my customers. It happened while I was attending our

last meeting in Buffalo, and I did not get an opportunity to see it for about a week after my return, the animal having been put in the hands of another for treatment. When I first saw the case the horse was standing in a single stall on a hard floor, having just been helped up. It seemed impossible for him to stand, so I concluded to place slings under him as soon as possible, until a box stall could be arranged, when he was placed in it with difficulty. He lied down almost immediately, and upon examination, I found the left leg badly swollen, with an exudation from the quarters. The wound had not been properly opened, and the pus was allowed to burrow and came out of the heels. The right leg had received a little better attention, the opening being large enough to allow the pus to escape.

Symptoms.—Very nervous; not able to walk; seemingly having lost the use of muscles; loss in appetite; temperature $105\frac{1}{2}$; respiration hurried; bordering on septicæmia.

Treatment.—Sedatives, to regulate temperature and nerves. Tonics, alteratives and stimulants to counteract septicæmia and improve appetite. Changed position from side to side three or four times daily. Removed all detached portion of sole and frog of left foot, dressing antiseptically three times daily and applying carbolized flax-seed poultice (warm.) On the right I used cold poulticing and this is the point I would like an interchange of ideas upon: whether hot or cold applications are preferable for the treatment of laminitis on nail in foot before suppurating, as there is quite a difference of opinion on this question, even amongst us to-day.

As soon as suppuration ceased, cold bran poultices were applied until the fever was reduced; then blisters were applied.

Complications.—Injury to navicular joint of left foot. Inflammation of pedal bone, or peditis in right, small quittor on each quarter of left foot and paralysis of lips due to injury while lying in stall.

The former yielded to cold applications and blisters; the quittors with peroxide hydrogen and poulticing; the lips with nerve stimulants and mild blisters over the nerve.

REPORTS OF CASES.

SPECIMENS FOR THE MUSEUM OF THE AMERICAN VETERINARY
COLLEGE.

Sent by DR. R. H. HARRISON, D.V.S., Atchison, Kan.

1. *Bony Tumor*.—This was hollow and taken from the right hind leg of a 16-hands brown mule, eight years old. Was seen by me at Kansas City. Had been treated by several veterinarians without success. Advised her to be surgically treated. The tumor was well defined, situated at the lower external extremity of the tibia, and was irritated by the trace, the animal being worked on the off side.

Operation consisted in enucleation, which was quite simple. The aponeurosis of the lower tibial region was *internal* to the tumor, its external covering being skin, and an amount of connective tissue and plastic deposit. Its contents were bloody serum and the debris of broken-down tissue. The remarkable fact to me in this case is that the openings were directed inwards; otherwise the animal was healthy and showed no bony deposits elsewhere. The case did very well, and after a year showed no sign of operation.

2. *Hydrocephalus Head*.—A black draft mare, six years old, 16-hands high. Called to attend during labor after she had been suffering twelve hours. Examination showed anterior presentation with fore-legs turned back, and head turned to the side and downwards. After straightening fore-extremities and bringing them out, made out that the head was enlarged, and will admit that I was very much puzzled by the softness of the frontal space, which you will see in specimen that the bone is absent. Found, after several hours of *very* hard work, that I could not straighten head, although I had a hook in the nose and a repeller against the chest. So advised destroying mare as her condition was very bad; the pains were something extraordinary. Send you the head, which was covered with skin and hair. Brain seemed to fill cranial cavity completely, and was quite solid.

PERITONEAL RESISTANCE IN THE DOG.

By C. E. CLAYTON, D.V.S., Bridgeport, Ct.

The 17th of this month I spayed a spaniel bitch, did it the best I could, and didn't see her again till the following Wednesday. The wound was united perfectly, and told the owner to keep bandage on. Saw owner Saturday following and advised him to keep bandage on for two or three days longer, but he took it off the next day and didn't wash her. To allay itching, she tore it open, and when I saw her there was about one foot of intestines hanging out, and the outer coat bitten. Washed them thoroughly with warm creolin water, and sewed up again. Saw her this Thursday past, and it was all healed again. To me, a young practitioner, this effect of antiseptic and of peritoneal resistance, even in a dog, is somewhat wonderful.

EXTRACTS FROM GERMAN PAPERS.

By RICHARD MIDDLETON, D.V.S., Philadelphia, Pa.

TUBERCULOSIS IN SMALL ANIMALS.

In the eight years embraced between 1886 to 1893, the Berlin hospital for the small domestic animals (connected with the Veterinary College) treated 40,000 patients.

Among these tuberculosis was proven 281 times; a confirmation *intra-vitam* was, until the introduction of tuberculin, exceeding unreliable and difficult. In general this affection was seldom found in the dog, more frequent in the feline species and most common in birds, the parrot seeming most to suffer its deadly termination.

From among 625,000 sick dogs, phthisis was proven 27 times—0.04%. Out of 615 cats, 6 had the affection; these were in the last two years, and were discovered with the aid of tuberculin. In striking contrast to these figures we ascertain the mortality of the parrot to be 170 out of a total of 700 sick—25%.

In other localities, the occurrence of the disease in canidæ is more frequent. Jensen, Copenhagen, records 28 cases in a very short time; Cadiot found, between 1891 and 1893, out of 900

patients a death of 40 (not diagnosed during life). Föhner also used tuberculin as a diagnostic means. This substance proved of great worth when applied in the dog, although the objection of uncertainty is here again urged against it.

Single instances of consumptive dogs failed to respond to the injection, but as a rule, when the effect was secured it came more precipitate than in bovidæ. In one case the temperature mounted from 101° to 103° F.; post-mortem exposed phthisis, lesions and bacilli.

In another animal the effect was first apparent after the lapse of six hours, and then was indicated by an increase of only 1° F., which subsided two hours later.

Here tuberculosis was discovered and also bacilli; the dose each time was 0.05 grammes with 3 ss of a ½% carbolic solution.—*Monatschrif. f. Thierheilk Bd. x.*

OPERATION FOR CHAMPIGNON.

A ten-year-old gelding, which had been castrated at six years, had exhibited symptoms of scirrhus cord for one year. The patient ambulated with a characteristic habit of spreading the posterior limbs, going lame in the left one and finally becoming unable to move. Robust health prevailed previous to this, and even now the constitution did not seem influenced by the drain of suppurative products from the canal.

Six grains of morphia sulph. were inhibited, as well as three and a half ounces of chloroform given as an inhalation, requiring eight minutes; during the operation the same quantity of the anæsthetic was administered by dropping slowly on a tense towel held over the nostrils.

The left spermatic cord was entered by four tracts, which ultimately merged into two, one of which directed its course anterior to the penis, and the other to the inguinal canal. The former was dissected from the cavernous tissue of the sexual organ, and the latter, when secured as high as the external inguinal ring, was ligated with an elastic bandage; the circumference of the thickened cord at this point was six inches. The

right cord was considerably smaller and easily extirpated by shelling, so to speak, from its adjacent envelopes.

The operation consumed two hours, but without the loss of much blood. The animal stood upon its feet at the termination of the same, and was led into the stable. The respiration at this moment was accelerated and somewhat labored, horse slightly uneasy. In an hour the breathing became more a dyspnœa, an abundant sweat transuded, patient succumbed.

The post-mortem, undertaken immediately, exposed the left side of the heart intensely filled. In the splenic vein a yellow, brittle and dry thrombus; these were also found in the various veins of the portal system.

From the fact that no vertebræ fracture or excessive hæmorrhage took place at the time of the operation, the death was supposed to be superinduced by the chloroform.—*D. Th. Wochenschrift.*

LEUCOCYTHÆMIA IN EQUIDÆ.

A ten-year-old horse, previously healthy, evidenced sudden weakness and unsteadiness of gait, with a great disposition to assume the recumbent position.

Pulse regular and 68 per minute; respiration superficial, numbering 30; temperature 104° F.; mucous membranes tinted a yellowish grey. The succeeding day these symptoms better marked and more intense. Third day the same still more pronounced with great weakness, anæmia of visible membranes and œdema along the median line extending from the pectoralis to the gracilli muscles. Patient succumbed on this date.

Upon examination about fifteen quarts of a reddish yellow fluid were obtained from the abdominal cavity. The liver, enormously hypertrophied, occupied both the right and left hypochondriac regions. Lymphatic glands along the colon and cæcum enlarged to ten times their normal dimensions. In the folds of the mesentery, globular reddish gray nodules in abundance.

These augmented glands were soft, and upon transverse

section offered a grayish surface streaked with reddish lines. At the apex of the cæcum a cyanotic formation as large as a goose egg. Lining membrane of stomach normal. Interior of the small intestine opaque and gray-red; same of colon and cæcum exhibited hæmorrhagic infiltrations with several erosions of considerable extent.

The liver weighed 84 pounds, 8 inches in thickness and 40 inches broad; reddish brown and friable; also the same peculiar strips of coloring observed in the lymph glands.

In the hepatic parenchyma innumerable tumors as large as a mustard seed. Lobes of the organ not distinguishable, and within its substance several cavities surrounded by dark red walls. Spleen swollen and measuring 20 inches in length, 16 in breadth and 2 in thickness; of a gray-blue color externally, with a yielding, not to say mushy interior. Malpighian bodies enlarged to the diameter of a pea.

Both kidneys hypertrophied and soft, with light yellow lines running from the papillæ to periphery. Contents of the infundibulum and pelvis of the organs slimy and containing pus. Bronchial and laryngeal glands augmented.—*Ztschr. f. Vet. Kunde* 1.

TUBERCULOSIS OF THE PENIS.

A number of nodular tumors, being situated on the penis of a bull, rendering the animal useless for propagating purposes, it was decided to castrate in order to further utilize the beast for draught purposes. Not long after this operation the same was slaughtered, and the lower portion of the penis—that part formerly containing the tumors—sent to the veterinary university in Dresden. Approximately 10 inches removed from the urethral opening two nodules were situated, which were about the size of a hazlenut. These were imbedded in the parenchyma of the organ.

Transverse section of these revealed a structure of cancellated tissue, which contained as its center a crumbling mass of whitish suppurative debris. About three inches anterior to the

above tumors the penis suddenly enlarged, being at the prepuce six inches in circumference.

Careful dissection exposed this expansion to be due to numerous hard bodies occupying the *intima* of the corpus cavernosum. Also numbers of the same nodules beneath the skin constituting the prepuce. Membrane of urethra normal in appearance; the presence of bacilli could not be proven by the Zihle-Gabbet method. Upon a thin section, obtained from the nodules themselves, great numbers of the bacilli could be detected. Subjected the same to the Koch-Ehrlich treatment.

From the character and extent of the infection it is highly probable that these organisms had been primarily acquired through the act of copulation, and secondarily by some imperfection or abrasion in the epithelium forming the cutis.—*D'tsch. Ztsch. f. Thmd.*

TETANUS IN THE CALF.—Glokke observed tetanus in the calf three weeks after castration. Tympanites was present. The masseter was strongly contracted and tense; the gluteal and caudal muscles were in a similar state. The tail was elevated and carried to one side of the mesial line; voluntary motion was not attempted. Upon examination, the wound proved to be in a healthy condition of cicatrization; the animal was slaughtered.

CHRONIC SUPPURATIVE INFLAMMATION OF THE SPLEEN.—A ten-year-old cow had continued to emaciate for six weeks, finally becoming so weak as not to be able to rise when down. The post-mortem revealed the spleen to be greatly hypertrophied; the same weighed 15 pounds and measured 23 inches in length, 8 in breadth and 3 in thickness, having withal a capsule much thickened. The parenchyma was a mixture varying in color from a bright yellow to a dark brown, and contained numbers of abscesses and collections of blood, pus and debris throughout its extent. Other pathological conditions were not found upon the animal.

ENTERIC CALCULI.—A heavy draught horse used for milling purposes, was subject to recurrent attacks of intestinal spasm, which, however, always yielded to the usual treatment of eserine

and warm water clysters. By examination per rectum the author was enabled to detect a solid, unyielding and stationary mass, situated in the pelvic flexure of the colon. Three days later the patient experienced another paroxysm to which he succumbed. The post-mortem exposed two stones or calculi, one within the other. The weight of these indicated respectively $8\frac{1}{2}$, $7\frac{1}{2}$ pounds.

NICOTINE POISONING IN THE HORSE.—A horse having the itch was subjected to a wash composed of an aqueous solution of nicotine, the latter obtained from the cleanings of tobacco pipes. As this did not seem beneficial, the pure article was applied over a part of the body with the result, that in ten minutes symptoms of intense poisoning were manifest. The subject begun with an abundant diaphoresis, trembled, and was very weak and unsteady. The cervical muscles were excessively contracted and hard; the head extended; conjunctiva dark red. Pulse 90 per minute, full, hard and quick. Legs and ears cold; respiration difficult and resembling that induced by intravenous injections of veratrum viride. The animal was quickly cleansed over the whole body with warm soap solutions, and received internally 3 iiss of ac. tannici. The symptoms disappeared in an hour.—*Ztsch. f. Vet. K.*

MYCOTIC GASTRO-ENTERITIS.—Territorial veterinarian Wilhelf performed post-mortem upon two cows which had died under the following symptoms: High fever, anorexia, cessation of urination, tympanites, dry fæces mixed with halmonshagic elements, cyanotic membranes, paralysis of the posterior extremities and rapid diminution of the vital forces. In the stomach proper, and in the ileum an intense inflammation had encroached upon the walls; this was associated with a secondary peritonitis of a septic nature. The small intestine was partially occluded by a bloody thin fluid, and the abdominal cavity contained a great quantity of a yellowish red and fetid effusion. The animal had been fed with turnips etc., which were in a state of semi-decomposition and covered with mould.

PROFESSIONAL ITEMS.

By N. N. S.

The last annual meeting of the Pennsylvania State Medical Association proved to be one of unusual interest, and many were the important topics considered. [We know it was, though we were favored with only one of the interesting papers read there.—ED.]

Secretary Lee, of the State Board of Health, favored by his presence the recent annual meeting of the Pennsylvania Association, and warmly encouraged them in their efforts to promulgate better laws for the control and suppression of contagious and infectious diseases among live stock.

Pennsylvania veterinarians will consider the wisdom of urging the passage of a State Veterinary Examiner's bill, which will examine and pass upon the qualifications of all future veterinarians desiring to enter practice in that state.

Wisconsin veterinarians have fallen into line and are agitating the question of better laws to control and eradicate tuberculosis.

There is a distinction without a difference between a resignation requested and a dismissal from office. It eases one's feelings, perhaps, to have the privilege of resigning, but when there is something added that it is expected within a few days, one might as well be decapitated peremptorily.

The semi-annual meeting of the Pennsylvania State Veterinary Medical Association will be held in September next at Harrisburg, the capital seat.

President Hoskins has called to the vacancy caused by the resignation of Dr. Gadsden on account of illness, Dr. C. C. Lyford, of Minnesota, to a position on the committee having in charge the Congress of Colleges. In higher veterinary education Dr. Lyford has been a pioneer.

Drs. Stickler and Baldwin of the State Sanitary Association have been elected honorary members of the Veterinary Medical Association of New Jersey. They are warm friends of the veterinary profession.

The veterinarians of New Jersey have a strong support of the State Sanitary Association, a very active and aggressive body.

Germany has already started an agitation against the exported products of pork from this country, strongly criticising the character of our microscopic investigations.

The Veterinary Medical Association of New Jersey is to be congratulated on the selection of Dr. W. B. E. Miller as president this year. It means active effort in the securing of active legislative enactments.

The people of New York should demand that the good work of exterminating tuberculosis should go on. The proposed legislation creating a commission may only be any easy way to check the good work.

The New Jersey Veterinary Medical Association, on the report of their committee, have approved of a good law for the control and eradication of bovine tuberculosis, and had the same introduced in their legislature on March 12, 1894.

The outbreak of glanders in Hoboken has been restricted in its disastrous results through the efficient work of Drs. Gerth and Dixon.

Secretary Hunt, of the New Jersey Board of Health, who took a keen and lively interest in the efforts to create a higher standard of veterinary education in this country, died at the beginning of last month.

Bulletins No. 43 and 53 of the Auburn, Ala., Agricultural Experiment Station, edited by State Secretary Cary, contain much valuable information that must surely lead to a higher appreciation of the profession in the South.

What has become of the "Philadelphia Veterinary Society"? Dr. Rogers, the president, should rise up and explain.

The recent meeting of the Michigan Veterinary Medical Association was a very successful one, and two sessions proved too short for the proper consideration of their programme.

VETERINARY LEGISLATION.

REGULATING VETERINARY PRACTICE IN OHIO.

A BILL to regulate the practice of Veterinary Medicine and Surgery.

SECTION 1.—*Be it enacted by the General Assembly of the State of Ohio*, That all persons who now, or shall hereafter, practice veterinary medicine and surgery in the state of Ohio, and have not been exclusively engaged in such practice for at least five years prior to the passage of this act, shall be examined as to their qualifications by a state board of veterinary examiners, to be appointed as hereinafter provided.

SECTION 2.—Any one who successfully passes the examination before the state board of veterinary examiners shall receive from said board a certificate signed by the members thereof, which certificate shall state that the person to whom it is given has passed the prescribed examination and is competent to practice veterinary medicine and surgery. A copy of such certificate shall be recorded by the clerk of said board in a book kept for that purpose which shall be open to the public inspection.

SECTION 3.—Persons who have passed the requisite examinations and received a certificate from the state board of veterinary examiners, and those who have continuously practiced veterinary medicine and surgery for at least ten years prior to the passage of this act, and no others, shall be qualified and be entitled to be employed as veterinaries by the State Board of Agriculture, State Live Stock Commission and State Board of Health.

SECTION 4.—The State Board of Veterinary Examiners shall consist of five members. The Secretary of the State Board of Agriculture and the Secretary of the State Board of Health shall be *ex-officio* of said board. Three members thereof shall be appointed by the Governor and confirmed by the Senate for the terms respectively of two, four and six years, and every two years thereafter the Governor shall appoint a member for the term of six years. Vacancies in said board shall be filled by appointment for the unexpired term. The members so appointed by the Governor shall be graduates of reputable but different veterinary schools or colleges, and men of superior learning, personal skill and good moral character.

SECTION 5.—The board shall meet twice a year—in April and July—in the city of Columbus. At the first meeting the board shall organize by electing from its members a president, secretary and treasurer, who shall hold their offices for two years or

until their successors have been elected and qualified. The Secretary shall keep an accurate record of the business transacted and of the certificates as heretofore provided. He shall collect the fees to be paid by the applicants for examination and pay the same over to the Treasurer, and shall perform such other duties as the board may prescribe. He shall keep a correct account of all moneys received and disbursed.

SECTION 6.—The board shall receive three dollars per day while in session, and their actual traveling expenses, to be paid by the Treasurer out of the fees paid by the candidates for examination.

SECTION 7.—A certificate shall be issued only when the board is satisfied that the candidate examined is well qualified and entitled to a certificate. The candidate, if unsuccessful, shall not be eligible to another examination until the expiration of one year thereafter.

SECTION 8.—Candidates shall present themselves for examination at the regular meetings of the board, and shall pay for each examination the sum of ten dollars, which shall accompany their application in writing, and be paid to the Secretary of board previous to the regular meeting of the board. One-half of the ten dollars shall be returned if the candidate fails in the examination or if a diploma is accepted in lieu of an examination.

SECTION 9.—The board may accept a properly issued diploma in lieu of an examination; but such a diploma shall be accepted only if it has been issued by a reputable veterinary school or college that requires a three-years' course of study and gives instruction in all the various branches of veterinary science.

SECTION 10.—Whoever shall engage in the practice of veterinary medicine or surgery in violation of this act shall, for the first attempt, be fined not less than ten dollars, and for the second offence not less than fifty dollars nor more than one hundred dollars, or be imprisoned in the county jail not more than sixty days, or both. Provided that nothing in this act shall be construed to prohibit any veterinary advice or assistance in cases of emergency if rendered by a person not entitled to practice under this act. Nor shall it apply to animal castration or dehorning of cattle.

SECTION 11.—This act shall take effect and be in force on and after its passage.

THE NORMAN OR COTENTIN BOVINE RACE.

BY MR. GUILLOT, Secretary, Herd Book (Calvados).

If meat is the principal production of the breeding of the bovine race, it must not be forgotten that in certain cases the milk production also gives important profits.

The Norman race unites perfectly these two essential qualities: the abundant production of a very rich milk and that of an excellent meat. A good Norman milch cow gives daily, on an average, from 25 to 30 quarts of milk, which furnish at least

2 pounds of that excellent butter, the reputation of which is undisputed.

The necessity of a good choice of domestic race acquires considerable importance at our epoch of universal opposition in all agricultural productions; we invite, then, the serious attention of breeders to the remarkable qualities of the Norman race.

Of a deep-dark coat, very often mixed with white spots, the Norman race offers a variety of color, which takes nothing away from the homogeneousness of that race very ancient and endowed with an excellent herd-book very rigorously established. The Norman cow has a large head, with eyes very prominent, the muzzle is thick and turned up, the horns are fine and bent forward, the skin is supple, the breast wide and spacious, the back is straight and the train behind of fine amplitude. The general conformation is then that of a good animal for butchers. An udder, well made and of good dimension, covered with a fine and supple skin, extends even under the belly, and permits us to see on its surface big lactiferous veins, a certain sign of the copious function of the udder.

The Norman race holds in French breeding the best place. It spreads more and more in the regions of the north and east of France, but especially in the environs of Paris and the large towns, where its milk and butter qualities are highly appreciated.

The Belgian breeders who have had the opportunity of appreciating this race and of buying a certain number of the international establishments of Antwerp (1886) and of Brussels (1888) are at present making a large importation. As fruitful a milking cow as the Dutch and Flemish, she is far superior to these last by the quality of the butter. The acclimation of this race in Belgium has caused no disappointment, thanks to its rusticity, demanding only good food in the cow house or good pasture.

Although the Norman race is not delicate, it must have abundant nourishment. It would be childish, in fact, to expect a considerable yielding in milk and meat from animals fed par-

simoniously. Experience has proved that the same quantity of fodder consumed by 10 cows gives more milk and profit than if it was consumed by 15 or 20 cows. Every milking cow ought to be well fed, and the breeder who considers his interest will never forget this Swiss proverb: "A cow is like a cupboard—you cannot get out of it anything that you did not put into it."

The Norman cow reaches the weight of 1200 to 1800 pounds, and keeps always an aptitude suitable for fattening, which permits it to supply for slaughter, after an abundant lactation, a return of meat very remunerative. It is in the breeder's interest to possess cows which, after having furnished him with a great quantity of milk can be sold off without any heavy loss. This double destination has besides a far greater advantage for breeding, for the male calves which are not kept as bulls furnish oxen that are quickly developed and soon get fat. The Norman oxen fatten at the age of $2\frac{1}{2}$ years, or 3 years reach the average weight of 1600 to 2000 pounds. It is not rare to find subjects weighing 2400 pounds at the age of 2 years. The meat is excellent, and so much appreciated on the market of La Villette (Paris) that it obtains currently a better price by $\frac{1}{4}^d$ or $\frac{1}{2}^d$ ($\frac{1}{2}$ to one cent) per pound than the special races for the shambles such as the Durhams, the Limousins, the Nivernais or their derivatives.

When the Norman race is better known it will obtain promptly that reputation which has perhaps been granted with too much infatuation to other races.

Let us add, in terminating, that the Norman Herd Book, created in 1883, and of which the seat is at Caen, Calvado, counts at present a considerable number of inscribed animals, sires and dams (about 7000). and that this institution puts under shelter from all foreign contact the purity of this excellent and fine Norman race, which has long been proclaimed the first milking race in the world.

For every information about Norman breeding apply to the correspondent of the Norman Herd Book, J. B. Guillot, at Mr. Chester W. Chapin, No. 1 Broadway, New York City.

NOTICE.

UNITED STATES VETERINARY MEDICAL ASSOCIATION.

Editor of the AMERICAN VETERINARY REVIEW:—

DEAR SIR:—The proceedings of the United States Veterinary Medical Association for the year 1893 will likely be ready for distribution in about thirty days.

Yours truly,

T. J. TURNER, *Sec.*

SOCIETY MEETINGS.

CALIFORNIA STATE VETERINARY MEDICAL ASSOCIATION.

A regular meeting of the California State Medical Association was held on June 13, 1894, at the Baldwin Hotel, San Francisco, Cal.

The meeting was called to order by the President, Dr. H. A. Spencer.

Upon roll call the following gentlemen answered to their names:—Drs. Whittlesey, Fox, Spencer, Sr., Spencer, Jr., Forrest, Egan, Robin, Williams, Hoggarty, Pierce, Eddy, Maclay, Jackson, Orvis and Archibald; visitor Dr. T. T. Twombly, Logan, Utah. The Board of Examiners reported favorably on the name of F. Forrest, and recommended that he be admitted to membership, which was voted upon and carried. The committee on certificates and that on legislative matters made their reports which were ordered on file.

Under the head of reading of papers, discussions, etc., Dr. D. F. Fox of Sacramento, read the following very original and instructive paper on "Diseases of the Liver as a Direct Cause of Intestinal Disturbances."

DISEASES OF THE LIVER AS A DIRECT CAUSE OF INTESTINAL DISTURBANCES.

MR. PRESIDENT AND GENTLEMEN:—In compliance with the request of our honorable President, and in order to assist in a small way in making our meetings as interesting as possible, I have, to the best of my ability prepared a short thesis on "Diseases of the Liver as a direct cause of Intestinal Disturbances," which I will now submit to you for your consideration.

This is a subject, gentlemen, which I have paid particular attention to in the last couple of years, and owing to its insidious and complex nature, and it being a subject which is so difficult to ameliorate and which in my experience does not readily yield to treatment, I naturally feel very anxious and ambitious to learn, from the exchange of ideas of those present here to-night, more about the pathology and treatment of intestinal disturbances. With this end in view I have attempted to advance a few ideas in which I hope to show that the majority of intestinal diseases are due to hepatic disturbance.

In order, therefore, to approach this subject in a comprehensive manner, we will first take up the consideration of the liver and its physiological properties.

As you all are aware, the liver being the largest as well as one of the most complex and important glands in the animal economy, and as it has some very essential and rather complex functions to perform, it is very easy to understand how any deviation from its normal condition will cause derangements of the alimentary tract.

The most important and one of the chief functions, the liver has to perform is the secretion of bile, the only one which pertains to the subject under consideration. There are, however, other functions, notably the one that controls the effect upon the blood during its transit through the hepatic circulation, whereby the blood is fitted for its subsequent purposes in the animal economy.

The secretion of bile is continually going on, but it appears to be greatly retarded during the period of fasting, and accelerated on the prehension of food, as has been shown by different experiments made by establishing a fistulous opening on the outside, it was noticed that during the period of fasting there was scarcely any bile discharged, but upon partaking of food an abundance of bile was discharged in a very few minutes.

The purpose served by the secretion of bile may be said to be of two principal kinds:—Excrementitious and digestive. From the peculiar manner in which the liver is supplied with much of the blood that flows through it, it is possible that this organ is excretory, not only for such hydro-carbonaceous matters as may need expulsion from any portion of the blood, but that it serves for the direct purification of the stream which arriving by the portal vein has gathered up various substances which may need be expelled almost immediately after their absorption, for it is easily conceivable that things may be taken up during digestion which are not only unfit for the purpose of nutrition but which would be positively injurious if allowed to mingle with the general mass of blood.

The liver therefore may be supposed, placed in the only road by which such matters can pass unchanged into the general current, to jealously guard against further progress of effete matters and turn them back again into an excretory channel. One

chief function of the secretion of bile is purification of the blood by ultimate excretion of effete matter, yet there are many reasons for believing that it is in the intestines where it performs its most important function in the process of digestion. In nearly all animals the bile is discharged, not through an excretory duct communicating with the external surface nor with a simple reservoir as most secretions, but it is made to pass direct into the intestinal canal, where it mingles with the chyme directly after it leaves the stomach, an arrangement the constancy of which clearly indicates that the bile has some important relations with the food with which it is thus mixed. A similar indication of its digestive properties is furnished by the fact that the secretion of bile is most active, and the quantity discharged into the intestines, much greater during digestion than at any other time, although, this activity may, in part be due to the fact that a greater quantity of blood is sent to the liver through the portal vein at this time, and that this blood contains some of the materials of the food absorbed from the stomach and intestines which may need be excreted either temporarily, to be afterwards reabsorbed, or permanently.

Bile is a somewhat viscid fluid of a yellow or greenish color, it has a strong bitter taste, and when fresh has scarcely any preceptible odor, it has a neutral and slightly alkaline reaction, its color and degree of consistency vary considerably, apparently independent of pathological changes in the liver. The saline or inorganic constituents of the bile are similar to those found in most of the other secreted fluids, the neutral phosphates, carbonates of sodium and potassium do not exist in the fluid state, but are formed during the act of incineration and are found in the ashes. Oxide of iron is also said to be common constituent of the ashes of bile, copper is usually found in healthy bile and continually in biliary calculi.

Regarding the functions discharged by the bile in digestion, it may be said that it assists in emulsifying the fatty portions of the food, and thus rendering it capable of being absorbed by the lacteals. It has considerable antiseptic properties and may prevent decomposition, purification and fermentation of food during its passage through the intestines. It also acts as a natural laxative by promoting an increased secretion of the intestinal glands and by stimulating the peistaltic action of the bowels, thereby assisting them in the propulsion of their contents.

Let us now for a moment consider in what manner we can arrive at a conclusion as to how we can account for the fact that intestinal disturbances are the result of morphological changes in the hepatic gland. As we have already stated the liver is a very large organ and has some very important functions to perform of which perhaps the most important is the secretion of bile; bile therefore being a very essential substance in the process of digestion, it is perfectly plausible that an insufficiency or a preponderance of this important fluid, will and does at once lead to intestinal derangements.

Being fully cognizant of the fact that one of the chief functions of bile is to act as an antiseptic, by preventing the food with which it comes in contact, from undergoing the processes of decomposition and fermentation, we can readily see that an insufficiency of this very important material will allow the the ingesta or contents of the intestines to become septic, putrid or fermentitious, a condition which is frequently demonstrated by the foetid aroma which always attends the fecal matter of these cases. Again bile being a natural carminative, an insufficiency of it will frequently be shown

in the so-called flatulent colic, which formerly was supposed to be due simply to fermentation of the food. Bile also acts as a natural purgative by increasing the secretion of the intestinal glands, therefore, if the supply is curtailed we are pretty sure to have indigestion, constipation, etc., follow as a sequel. If however, the supply is increased beyond normal we have as a sequel diarrhoea, and I might state in this connection that it is my opinion that a great many cases of chronic diarrhoea are caused by a preponderance of the bile being thrown into the intestines a condition which is due to an over active liver. Bile acting as a local irritant stimulates peristaltic action of the bowels and increases the vermicular motion, thereby propelling or forcing the food through their channel; knowing this fact we can readily see why a lack of this natural irritant which produces peristalsis will be followed by torpidity, paralysis, impaction, inflammation, and gangrene of the intestines. While it is possible to attribute and perhaps trace all lesions of the intestinal tract to be due to a morbid liver, yet I do not wish you to think that I advocate this idea, for I am fully aware of the fact that there may be and are numerous diseases of the intestines which have no connection with and are independent of any pathological changes in the liver, but as there are so many intestinal disorders which are liable to follow hepatic disturbances, I would suggest that a very rigid examination of the liver be made when called upon to administer to any animal affected with any disease of the visceral organs.

In establishing proof or in substantiating the above statements, I will with your kind permission describe one of these particular cases which in my estimation have their origin in the hepatic gland. For instance, you are called to see a case which on your first examination will be lying down in the recumbent position or standing in the stall, comparatively speaking, quiet, but upon closer examination you will notice that from time to time he will look around at his flank, or elevate the head and turn up the upper lip. If we now, supposing the animal to be lying down, make him get up, he will walk around the stall a few times and will apparently make at intervals attempts to urinate, or to lie down again, finally if he does not lie down he will go into one corner of the stall and stand there for some time in an attitude apparently of repose. Upon still closer examination you will find the pulse running from forty to sixty, temperature one hundred and one to one hundred and two, the conjunctivæ will be of a dirty reddish yellow color. If you now manipulate the mouth you will find that the tongue and mouth have a furred and soapy feeling, and the breath has a sour foetid odor; upon auscultation at the flank you will notice an absence of borborygmous sounds that clearly indicate that there is an absence of peristaltic action of the bowels, upon percussion over the region of the liver on the right side the animal usually evinces pain. The fecal matter passed is dry, hard and thickly covered with mucous and is passed in small quantities, in some cases the sphincter ani has lost its contractability which leaves a permanent dilation of the rectum. If no relief is given the animal will usually linger on in this condition apparently with no perceptible change for from eight to twelve days when you will notice a change for the worse, when enteritis sets in and the animal quickly succumbs to its baneful effects. If properly treated however, a successful issue may be looked for in from three to five days.

Now, gentlemen, believing that all of you have from time to time been called to prescribe for like cases when you felt as I have done on numerous occasions that you were, if you will permit me to use a hackneyed expression, "at sea" regarding the

particular lesions you are to prescribe for; having this circumstance in mind I concluded by presenting this matter before this honorable body, through whose experience and exchange of ideas I can reach a conclusion as to what manner I can therapeutically prescribe for these cases, so I can endeavor to remove the cause and not as I believe I have been doing heretofore, endeavoring to remove the effect.

The President called upon Dr. Spencer, Jr. to open the discussion, which he did by saying that he had been called upon to treat a great many cases such as described by the essayist, and he fully concurred with the essayist, in that the primary lesions in the sex cases, are to be found in the hepatic gland, in the majority of cases. The discussion was also participated in by Drs. Orvis, Whittlesey, Maclay, Twombly, Archibald and Egan. They all complimented the essayist on the originality of his remarks. Some of the members, however, did not agree with essayist and stated that it was their opinion that if there was liver disease present in these cases, it was purely a secondary lesion. Dr. Egan mentioned a very interesting case in which the cause of death was due to hepatic lesions. Dr. Spencer, Jr. said that he had treated the disease with aloin followed by tonics with good success. The secretary stated that he had treated these cases with drastic purgatives without success, but since he had applied treatment toward the amelioration of hepatic derangements, he had quite a decrease in the mortality of the cases he was called upon to treat.

Dr. Whittlesey said he had held post-mortems on several of these cases without discovering any changes in the hepatic gland.

The President closed the discussion with a few well chosen remarks. He said this was a subject which should receive a great deal of attention at our hands; he believed there were a great many cases of intestinal disturbances due to hepatic lesions. In closing his remarks he stated that he thought that we were as an association very fortunate in having a membership of gentlemen who were particularly desirous of introducing at our meetings, subjects of which very little is known, in order that in the exchange of ideas which follow the reading of the papers,

points would be raised, which would lead us, or enable us to treat these cases on a more scientific basis.

Dr. J. H. Eddy of Stockton was then called upon to entertain the meeting, which he did by reading a very practical thesis on "Tetanus."

TETANUS.

MR. PRESIDENT AND GENTLEMEN:—At the last meeting of this Association, I was appointed by our honorable President, Dr. Spencer, to write a paper upon some subject pertaining to the veterinary profession. I do not propose by presenting for your consideration this paper upon the subject I have chosen, which is Tetanus, to speak much from practical experience, but nevertheless the following may serve to refresh your memories and perhaps give some of you new ideas.

The word tetanus is derived from a Greek word which means to stretch. It is a specific disease characterized by continual contractions of the voluntary muscles and later the involuntary, with tension and rigidity of the parts affected. When the term tetanus is used it applies to the whole body being involved, it is often seen where only the muscles of mastication are involved, it is then called trismus, if the muscles of the cervical and dorsal regions are involved it is called opisthotonos, if the muscles of one side are involved the term tetanus lateralis is used.

This disease is now considered to be due to a micro-organism, which is a drum stick shaped bacillus called the bacillus tetani or the germ of Nicolair, so named from the discoverer who discovered it in 1886, but it seems that Rosengoff and Koch found it at about the same time. The germ has a spore of reproduction at one end, and is anaerobic in character. This fact is quite important; we will understand by this why a small puncture or closed wound is more liable to be followed by this disease than a large open one. No doubt some of you have seen cases where tetanus developed after a wound had almost completely healed, it then having the nature of a closed wound, the anaerobic character of the germ explains this, the exogenous character of the germ was discovered by Nicolair, April 1887; he found it in the soil especially around old gardens; it is found in horse manure, also on surgical instruments improperly cleaned after they have been used on a wound infected with the germ, and it may be transmitted in this way from one animal to another. In the diseased animal the germ remains near the seat of introduction, and it is found in the secretions of the wound, in the nerves leading from the wound, and some claim to have found it in the spinal cord. The presence of the oxygen of the air causes the germ to remain in a partial dormant state, but as soon as it is introduced into a wound, where the air is excluded, combined with the heat and moisture it causes it to develop and reproduce. Kitasato, a Japanese student in Dr. Koch's laboratory isolated the soil bacillus and reproduced the disease in animals by inoculation, thereby proving that the germ found in the soil was identical with that found in the wound of an animal affected with the disease. Prof. Kitt of Munich made some interesting experiments in the way of inoculating several horses from a horse that had died from tetanus; he says that tetanus in the horse is caused by a bacillus identical and resembling that of human and soil bacillus. Another interesting contribution on this subject is that of Dr. Bassano whose excellent

work in demonstrating to us the presence of the bacillus tetanus in different soils. He found upon examination of forty-seven different soils from different countries that twenty-three contained the bacillus. From the various clippings I have here presented I think we can be safe in arriving at the following conclusions; first, that tetanus is a specific infectious disease; second, that the specific germ does exist outside the animal economy; third, as the germ is found in the soil, dry dust, manure, etc., it is quite difficult to determine from where it first takes its departure. The observations of Sarmoni should not be overlooked in regards the action of the intestinal secretions upon the bacillus, he says he has caused herbivorous and carnivorous animals to swallow pure cultures of the bacilli, by this means he came to the following conclusions: first, the flesh of animals that have died from tetanus can be eaten with impunity; second, the microbe of tetanus can pass through the alimentary canal of carnivorous and herbivorous animals without causing any symptom of the disease; third, the digestive secretions of these animals neither kill or in any way alter the bacillus; fourth, an animal can swallow a dose of tetanic virus two thousand times greater than that which is sufficient to kill if injected subcutaneously. The traumatic form is due to a wound or abrasion in the skin or mucous membrane; tetanus usually follows in from two to twenty days after the germ is introduced. The reason for the variable length is, first, the number of germs introduced; second, the advantages given the germ. It may follow castration, tail docking, etc. I have seen it follow the operation of umbilical hernia in a colt. Intestinal parasites may also be mentioned as a cause. After the micro-organism gains entrance to a wound the heat and moisture as I have already mentioned arouses it to increased action. As the germ itself remains near the seat of introduction it is now believed that the product of the germ or ptomaine, as it is properly called, is the cause of the disease, inasmuch as these ptomaines are taken into the circulation and in some way poison the blood, this in turn so affects the nervous system as to cause rigidity of the muscles as characteristic of the disease.

The idiopathic is caused by exposure to cold rains, or extreme heat, it may follow a mild case of sun-stroke. I have seen a case of trismus brought on by animal being overworked on a hot day; this case recovered entirely within three days.

I do not think it necessary to take up valuable time in giving the semiology of this disease, for I do not consider it a difficult disease to diagnose after an ordinary examination.

The prognosis of the traumatic form is usually unfavorable, if the attack is very mild we may say the animal has even chances. The idiopathic form nearly always terminates favorably. When death takes place in either form it usually occurs in from two to ten days, either by complications of the pulmonary apparatus or from nervous exhaustion brought on by continual muscular rigidity or from hyperpyrexia associated with an elevation of temperature to such a degree that the organic functions of the heart and lungs are involved and finally cease.

Prof. Williams says that in post-mortems performed on animals which have died from traumatic tetanus he invariably found the nerves leading from the injured parts to present signs of inflammation, the neurolemma is more vascular than normal, the vessels of the spinal cord are engorged and the sub-arachnoid space contained effusion.

I will now say a few words about the treatment of this disease. In regards to this I have nothing new to offer. These cases are usually well advanced before we are called, at least I have found it that way. I have tried several different courses of

treatment without the desired result. I have had some get well, but I can't say it was due to the treatment, as I have tried the same remedies on other cases that terminated fatally. Perhaps those that did recover would have done so if they had received no treatment. There is a treatment advanced which is claimed acts like magic. It is as follows: inject into the veins of the affected animal the blood serum obtained from a recently recovered case; this is said to destroy the virus. To do this however, we would have to have a recently recovered case on hand all the time. This treatment consequently is not practical. Some claim to have an infallible remedy for this disease which they keep for their own use. I dare say they have not, but when this kind of a drug or combination of drugs is found I shall be pleased to hear it, and I am sure it will be a welcome addition to veterinary science.

It was followed by an animated and lengthy discussion, which was confined principally on the etiology of the disease. The following gentlemen participated in the discussion: Drs. Spencer, Jr., Whittlesey, Archibald, Orvis, Fox and Pierce.

Dr. Forrest was called upon to read a paper on "Springhalt." The essayist without going into the pathology of the disease, described a case which he had treated, and in which he performed a cure by performing the operation known as peroneo-prephalangeal tenotomy.

On motion by Dr. Whittlesey a vote of thanks was tendered the essayists for the able and masterly manner in which they had entertained the meeting.

Dr. Twombly was requested to give an account of a few experiments he had made with tuberculin, in Utah, a request which he cheerfully complied with.

The Secretary proposed the name of J. H. Edmons of Los Angeles for membership; the name was referred to the Board of Examiners.

The Secretary presented a communication from the Secretary of the United States Veterinary Medical Association, regarding the possibility of having some representation at the next meeting of the National Organization.

There being no further business to come before the meeting it adjourned to meet in San Francisco, September 12, 1894.

R. A. ARCHIBALD, D.V.S., *Sec.*

OBITUARY.

EVERETT W. ROWLAND, D.V.S.

It is once again our sad duty to record the death in the ranks of the Alumni Association of the American Veterinary College, from that terrible disease Phthisis. Dr. E. W. Rowland, of the class of 1882, died recently in Denver, Col.

SUNDRY NEWS.

TUBERCULOSIS IN SHORT-HORNS.—It is said that as a sequel of the application of the stamping out of pleuro-pneumonia, the sanitary authorities have discovered the serious fact that the number of tuberculous cows in the dairies of Edinburg was of 22%, and in those of London 12%.

VETERINARY ORGANIZATION IN TURKEY.—A veterinary service has been organized by the Sultan's order. Candidates must be Ottomans, and hold a diploma delivered by one of the Turkish veterinary schools. Ottomans having a foreign diploma must be submitted to an examination. Foreign veterinarians may be admitted to practice but must also submit themselves to an examination. Civil veterinarians are divided in four classes, and receive various salaries. There are ten veterinary inspectors for the sanitary service of the frontiers.

ADMISSION IN GERMAN VETERINARY SCHOOLS.—The German Veterinary *Council*, representing all the veterinary societies of the Empire, some 2,000 veterinarians, have petitioned the Chancellor of Germany to obtain that students shall not be admitted in veterinary colleges unless having received the degrees which are required to allow matriculation in the universities of the Empire. France and Belgium have already those requirements; a diploma of bachelor is required in those countries.—*Rev. Vet.*

GLANDERS IN CUBA.—This disease is reported prevailing extensively in that Spanish island. The first case of contagion to man is reported in 1870, but since it is said 30 or 40 persons died yearly.

A COMMISSION FOR INVESTIGATING TUBERCULOSIS AMONG CATTLE.—A bill has been introduced into the New York Senate providing for a further inquiry into the existence of tuberculosis. The wide prevalence of consumption in cattle has been a question of much concern to the State Board of Health, and last year the board's inspectors killed over twenty thousand head of cattle which were afflicted with the disease, and for which claims aggregating thousands of dollars are being filed daily by the State Board of Claims. The new bill provides for a commission to consist of one member of the State Board of Health, to be designated by said board; three breeders of thoroughbred cattle, each engaged in the breeding of a separate and distinct breed, to be selected by the directors of the New York State Dairymen's Association, and Prof. James Law, Professor of Veterinary Medicine in Cornell University. The commission is to have all the power now granted to the State Board of Health to examine the cattle of the state for the disease known as tuberculosis, and to examine into that disease, its existence, and any other facts concerning it that may now or hereafter be brought forth, and report the same to the Senate by January 15, 1895, setting forth all work done and all experiments made, and such suggestions for the proper continuation of the work as will tend to remove the disease from the cattle of the state. Fifteen thousand dollars is appropriated for the expenses of the commission.—*Medical Record*.

CORRESPONDENCE.

UNITED STATES VETERINARY MEDICAL ASSOCIATION.

DR. A. LIAUTARD:--

My Dear Doctor:—In reply to your recent favor inquiring about the program of our meeting in September next at Philadelphia, I would state that the subject of "Tuberculosis" will

again be considered, and particularly upon the use of tuberculin as a diagnostic agent, and as to the methods of stamping out this disease, also many other points in connection with the diagnosis of the disease in the bovine species, which are of peculiar interest and importance at this time. There will be a paper by Dr. W. L. Williams, giving a brief description of the diseases that are prevalent in the Rocky Mountains with a description of the special characteristics that they assume in that location. There will be a paper by Dr. S. J. J. Harger on "Neurotomy as a practical operation." Dr. Olof Schwarzkopf will present his paper that he was unable to render at our Congress in October last. In addition to this, I have some three or four other papers in view which assures us of a program that will be of particular interest at this time.

Very truly yours,

W. HORACE HOSKINS,

President.

P. S.—The discussion of Dr. R. H. Harrison's paper on "A New Method of Treating Periodic Ophthalmia by Surgical Interference" will be discussed at this meeting, and might I not ask you to suggest someone who would give the matter consideration and be prepared to discuss the same?

W. H. H.

ASSISTANT WANTED.

A young man, of good moral character, bright, energetic, ambitious, preferably a graduate of the American Veterinary College. Must have had experience, in a mixed practice.

Address

ROSCOE R. BELL, D.V.S.,

Seventh Ave. and Union St., Brooklyn, N. Y.

PRACTICE FOR SALE.

I will sell my practice and complete outfit of instruments cheap. Waterloo is a fine city of 12,000 inhabitants, and only one other veterinarian. Good farming country and good pay. Object for selling, want to quit the business.

RUFUS W. FINLEY, M.D.C.